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The Impact of Pre-Kindergarten Attendance on Later Academic Achievement in a Mississippi School District

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The impact of Pre-Kindergarten attendance on later academic achievement in a Mississippi School District

By

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In an era of high stakes testing and accountability, educators and policy makers are working to improve the educational outcomes for children. In a quest to help children achieve at high levels, Pre-Kindergarten is often cited as a proactive strategy to address the academic gaps many children have upon entering school. While the goal of Pre-Kindergarten is to prepare children for later schooling, it is important to determine if this costly strategy has sustainable, long-term academic benefits.

The purpose of this research was to determine if a Title I, Part A Pre-Kindergarten program had an impact on the later academic achievement of children in a rural, high poverty, high minority, public school district in Mississippi. The results from this study can provide educators and policymakers with data as they work to align resources to provide an effective education program. It can provide educators with information to review and revise practices and procedures for positive early childhood education experiences.

The quantitative, causal-comparative study examined the 3rd-grade academic achievement of children to determine if a significant difference existed between the

students who received Pre-Kindergarten services and those who did not. Student scale scores on the Mississippi Department of Education 3rd Grade Reading Summative Assessment and student attendance data were used to explore student's later academic achievement.

The overall collective data results from the study suggest Pre-Kindergarten participation does not significantly improve the reading scores of children at the end of 3rd-grade. Although variances in the data were shown, it may be a result of the small sample sizes. The children who attended Pre-Kindergarten did miss significantly fewer days of school. The recommendations for future research are as follows: (a) conduct a longitudinal study to determine how students who received Pre-Kindergarten services compared to those who did not in later grades such as grades five, eight, and a later high school grade, (b) replicate the study with data from the children who received Pre-Kindergarten services in an Early Learning Collaborative in Mississippi, and (c) conduct a qualitative study of 3rd grade teachers to see if they recognize a difference between the Pre-Kindergarten participants and non-participants.

Key words: Pre-Kindergarten, education, student achievement, Literacy Based Promotion.

DEDICATION

I dedicate this study to my precious children, Trex and Baleigh. I will always love you the most! My greatest blessing has been being your mother. You are both wonderful and amazing and a true gift from God!

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I thank God each day for all His blessings and for His son Jesus Christ who died for my sins.

I thank my precious children, Trex and Baleigh, it has been a long journey completing this project. Thank you for continually reminding me I had left work unfinished.

I thank my parents, Bud and Elizabeth Cox, who always made me believe I could do anything I wanted to do. I always know where home is. Even though my father's mother, my MaMaw is in heaven, I thank her for her love and for creating memories.

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In one's lifetime, it is unusual to have friends for decades who love you like family. Lindsey and Lucy Keene and Milton "Bud" Matthews, you have richly blessed my life.

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CHAPTER I

INTRODUCTION

Introduction

President Lyndon B. Johnson launched the War on Poverty in his 1964 Annual Message to the Congress on the State of the Union (Johnson, 1964). The War on Poverty yielded two program initiatives which continue to have a direct impact on education today. These initiatives are the Elementary and Secondary Education Act of 1965, as amended, which established the Title I, Part A program to provide supplemental funds to school districts with high percentages of impoverished students; and the Economic Opportunity Act of 1964, which created Head Start (Matthews, 2014).

According to the National Head Start Association (n.d.a), the program was designed to help break the cycle of poverty by focusing on children from low-income families. The United States Department of Health and Human Services, Administration for Children and Families (n.d.) noted Head Start provides children not having attained school age with a comprehensive child development program to meet the emotional, social, health, nutritional, and psychological needs and provides services to disadvantaged children and their families in order for these children to start school on the same level as their more advantaged peers.

The Elementary and Secondary Education Act of 1965, as amended by the No Child Left Behind Act of 2001(NCLB) required high stakes accountability measures for

public schools across the nation (NCLB, 2001). The federal legislation required states receiving federal Title I, Part A dollars to implement statewide assessments for public schools in reading, mathematics, and science using the results for accountability purposes (United States Department of Education, 2004). Assessment results were also required to be disaggregated by subgroups to ensure all students were making adequate academic progress (NCLB, 2001). This significant change not only required disaggregation by subgroups, but it also required states, school districts, and schools to publicly report test score results for each subgroup. NCLB defined the subgroups as: all students, students with Individual Education Plans, limited English proficient students, economically disadvantaged students, Asian students, African American students, Hispanic students, Pacific Islander students, and Caucasian students (Glossary of Education Reform, 2015).

The Every Student Succeeds Act, signed into law in 2015, reauthorized the Elementary and Secondary Education Act of 1965, as amended (Every Student Succeeds Act of 2015, 2015). The Every Student Succeeds Act (ESSA) replaced The NCLBin the 2017-2018 school year (Klein, 2016). According to the United States Department of Education, Office of Elementary and Secondary Education (n.d.), the ESSA has removed much of the federal government's large presence in public education policy as it shifted much of the implementation design requirements to states and their stakeholders. Furthermore, ESSA maintained some of the NCLB requirements, primarily the requirement for student achievement of all subgroups in mathematics, reading, and science and public reporting of the disaggregated data (ESSA, 2015). Additionally, the high stakes testing and accountability requirements of NCLB will continue under ESSA

(Collier, 2017; United States Department of Education, Office of Elementary and Secondary Education, n.d.).

The Elementary and Secondary Education Act of 1965, as amended, has been a major contributor to the current discourse surrounding Pre-Kindergarten policy and funding (Center for Public Education, 2016; Zascavage, 2010). As local, state, and federal education budgets have continued to shrink, policymakers at every level have demanded publicly-funded programs have data to show how the resulting education systems have produced positive academic achievement results and have used taxpayer dollars effectively (Barnett, 2010; Bernardo, 2016; The Pew Center on the States, 2011).

According to the Center for Public Education (2012), as educators in public education systems felt the increased pressure to ensure all children reach high levels of academic achievement, they worked across multiple avenues to put structures in place to help all students reach academic proficiency. Bohrnstedt (2013) asserted as educators implemented interventions to help all children reach high levels of academic achievement, the educators discovered their efforts were often too late. Educators have found by the time children from low-income families are in Kindergarten, they are already far behind their peers in measures of school readiness and academic skills (Fantuzzo, Gadsden, & McDermott, 2011). The educational gaps have tended to become wider and much more difficult to close as children advance through elementary, middle, and secondary schools (Hanushek, 2016). According to Farran and Lipsey (2016), educators and policymakers have continued to turn their attention to prevention methods focused on the academic achievement gap before children reach Kindergarten. The high stakes accountability measures of NCLB have led many states to use Pre-Kindergarten as

a strategy to help children achieve school readiness and close the achievement gaps in elementary school and beyond (United States Department of Education, Office of Elementary and Secondary Education, n.d.).

The Pew Center on the States (2011) concluded the efforts of past decades were filled with policymakers and school reform leaders trying to reform Kindergarten through secondary public-school education at a tremendous cost and with limited success. Bohrnstedt (2013) reported current reform efforts were flawed due to the focus on closing the achievement gap long after it had surfaced with an indifference to Pre-Kindergarten. According to Shah et al. (2017), reform efforts geared to children playing catch-up have not proven very successful. The Association for Supervision and Curriculum Development (2006) described universal Pre-Kindergarten as possibly the most cost-effective intervention approach to closing the achievement gap or preventing it from developing. According to The Pew Center on the States (2011), Pre-Kindergarten has the ability to be the catalyst for increased academic achievement for children throughout their school years rather than a catch-up strategy. In contrast, Duncan and Murnane (2011) reported that while early childhood education was a particularly promising period for early remediation due to brain development, they cautioned against a direct leap from neuroscience to policy.

Pre-Kindergarten efforts were not limited to the states. President Barack Obama used his 2013 State of the Union Address to introduce his Preschool for All initiative (Politico, 2013). He proposed a series of new investments to provide high quality preschool for every child in America (Forbes, 2013). According to Whitehurst (2013b), the President's proposed investments included a state-federal partnership whereby school

districts and other partners would provide Pre-Kindergarten to all four-year-olds in families at or below 200% of the poverty line and would include teacher certification criteria. The second proposed investment of the President's plan would provide a massive expansion to the Early Head Start Program, which serves vulnerable children ages zero to three (The White House, Office of the Press Secretary, 2013). Matthews (2013) noted the third proposed investment would expand the Nurse Family Partnerships Program, in which nurses provide in-home services to promote good health and parenting to families from pregnancy through the child's second birthday.

Researchers (Camilli, Vargas, Ryan, & Barnett, 2010) concluded the early years of a child's life set the trajectory for his learning experiences. The foundations of brain development and subsequent development potential are created in a child's early years through a process extremely sensitive to external influence (Brown & Jernigan, 2012). According to the National Scientific Council on the Developing Child (2007), a child's early experiences shape the development and quality of the brain's architecture. Brain and neuron system development in the first years supports early language, literacy, mathematics, social skills, persistence, and centers that control attention, self-regulation, and behavior (Duncan & Murnane, 2011). Research in neuroscience has demonstrated the early years are a critical period in children's learning and development, providing the necessary foundations for more advanced skills (Kuhl, 2011). Researchers (Giedd et al., 1999; National Research Council, Commission on Behavioral and Social Sciences and Education, 2000) observed when a child's cognitive and emotional foundation was solidly built before age five, it led to the possibility of higher achievement as he progressed through school. According to The Pew Center on the States (2011), quality

preschool and Pre-Kindergarten participation during the period of crucial brain development helped children learn the essential skills needed for academic success.

According to the Center for Public Education (2012), understanding the purposes and benefits of Pre-Kindergarten changed considerably over the past decade. Although Pre-Kindergarten was once viewed as a childcare support for working parents, research has shown quality Pre-Kindergarten to be a valuable educational opportunity and a critical part of economic development (The Pew Center on the States, 2011).

According to Stevens and English (2016), policy efforts at state levels notably increased public preschool enrollment over the last 30 years. In 1980, only four states funded preschool programs, and those programs were quite small (Cascio & Schanzenback, 2013). They identified California, New York, Maryland, and Oklahoma as the four states with state-funded preschool programs, with implementation dates that ranged from 1965-1980. Barnett, Carolan, Fitzgerald, and Squires (2012) developed and applied ten criteria that must be met for a preschool program to be identified as a state preschool program. To be considered a state preschool program, it had to: "… be funded, controlled, and directed by the state; serve preschool-age children; focus on early childhood education in a group learning environment; and be distinct from the state's system for subsidized child care." (p. 3)

When the same criteria were applied in the 2014-2015 school year, state-funded Pre-Kindergarten programs were found in 42 states (Barnett et al., 2016). The primary goal of state-funded Pre-Kindergarten programs was to prepare enrolled children for school success by providing basic skills in the following areas: recognition of colors, shapes, letters, numbers; how to look at a book; and soft skills such as how to get along

with classmates (Barnett, Lamy, & Jung, 2005). According to Cascio and Schanzenback (2013), Pre-Kindergarten students attained the foundation to enter Kindergarten with both the skill sets and the built-in confidence created by early success. According to Ferrarello (2017), there was convincing evidence depicting children who attended quality Pre-Kindergarten programs were more prepared for school at the end of their Pre-Kindergarten year than children who did not. However, there was less evidence of the long-term academic impact.

Researchers (Reynolds, Temple, White, Ou, & Robertson, 2011) reported children who attended Pre-Kindergarten exhibited higher reading, mathematics, and writing skills when compared to their peers who had not attended a Pre-Kindergarten program. The *National Early Childhood Longitudinal Study: Kindergarten Cohort* showed children who attended a Pre-Kindergarten program scored higher on reading and mathematics assessments when compared to children who received only parental care (Gormley, Gayer, Phillips, & Dawson, 2005). Children who attended other preschool programs or a child care center showed gains, but not as much as the children who attended Pre-Kindergarten (Gormley, Phillips, & Gayer, 2008). Additionally, the researchers found children who attended Tulsa, Oklahoma's state-funded Pre-Kindergarten program outperformed non-attendees by nine months on reading skills, eight months on pre-writing skills, and five months on pre-mathematics skills. According to Barnett et al. (2005), a study across five states showed children in state Pre-Kindergarten programs had vocabulary gains 31% higher and mathematics gains 44% higher than those of non-participants. The researchers reported these increases placed Pre-Kindergarten children three to four months ahead of non-participants. Research on Georgia's universal

Pre-Kindergarten program found children overcame the achievement gap they faced prior to entering Pre-Kindergarten by the time they finished Kindergarten (Henry et al., 2004).

Minervion (2014) noted Pre-Kindergarten attendance had benefits that transcended income levels. Minority children were also found to benefit from Pre-Kindergarten (Farran & Lipsey, 2016). According to Gormley et al. (2008), Oklahoma's universal Pre-Kindergarten participants demonstrated significant academic gains across all racial groups and all family income levels. Additionally, the study showed Hispanic children gained 11 months in letter/word recognition and six months in applied problem solving in comparison to Caucasian children who gained nine and three months, respectively. Henry et al. (2004) reported Georgia's universal Pre-Kindergarten program showed children who attended the Pre-Kindergarten program were on target at the end of Kindergarten; however, a significant gap remained between African American and Caucasian children.

Considerable discourse has surrounded the long-term effects of Pre-Kindergarten. Specifically, do the effects dissipate over time or produce lasting benefits for the participants? One side of the Pre-Kindergarten conversation focused on research results that have shown quality Pre-Kindergarten to have long-term positive effects on the future lives of young children (Campbell et al., 2008; Nores, Belfield, & Barnett, 2005; Reynolds et al., 2011; Schweinhart et al., 2005). Yoshikawa et al. (2013) reported Pre-Kindergarten participants had higher rates of secondary school graduation when compared with non-participants. According to researchers (Campbell et al., 2008; Nores et al., 2005; Reynolds et al., 2011; Schweinhart et al., 2005), when Pre-Kindergarten participants reached adulthood, they were less likely to have been

arrested for violent crimes, more likely to be employed, and more likely to earn higher wages in comparison to non-Pre-Kindergarten participants. The other side of the Pre-Kindergarten conversation focused on research which supported Pre-Kindergarten and its generalization to universal Pre-Kindergarten. Whitehurst (2014) pointed to flawed research techniques in Pre-Kindergarten studies, citing:

1. The results of Pre-Kindergarten studies were combined, rather than analyzed as stand-alone programs.
2. Universal programs were not well implemented.
3. Randomized trials were not conducted.
4. Nearly all studies had limitations in external validity.

Whitehurst (2014) concluded that the, "Best available evidence raises serious doubts that a large public investment in the expansion of Pre-K for four-year-olds will have the long-term effects that advocates tout." (para 18)

A significant financial investment has been required to implement Pre-Kindergarten programs. Substantial fiscal support was an indicator of the degree of interest educators, policymakers, and parents continued to have in early childhood education as a tool for providing children with the skills needed for future school success (Lynch & Vaghul, 2015). The first State of Preschool Yearbook (Barnett, Robin, Hustedt, & Schulman, 2004) reported total state spending in the 2001-2002 school year for state-funded Pre-Kindergarten exceeded $2.4 billion, although 10 states accounted for 83% of all spending. According to Barnett et al. (2011), in the 2009-2010 school year state funding for Pre-Kindergarten from all sources was more than $5.4 billion, which was a reduction of nearly $30 million from the previous school year and would have

decreased more had states not received American Recovery and Reinvestment Act funds. They also noted this was the first-time total spending declined from the previous year since the National Institute for Early Education Research began tracking spending in 2002. In the 2014-2015 school year, total state funding from all sources increased to $6.2 billion, an increase of more than $573 million (Atchison & Workman, 2015).

In 2012, Mississippi was one of 10 states in the nation without state-funded Pre-Kindergarten programs (Barnett & Carolan, 2013). Canter (2012) reported 11% of four-year-olds in Mississippi were enrolled in public Pre-Kindergarten programs in the 2009-2010 school year; most of these children were non-special needs children who participated in Title I, Part A funded programs. During the 2011-2012 school year, 51 of the 152 school districts budgeted a combined $12.5 million in Title I, Part A funds to provide Pre-Kindergarten programs in public schools (Mississippi First, n.d.).

Mississippi passed its first Pre-Kindergarten law, the Early Learning Collaborative Act, in spring of 2013 (Early Learning Collaborative Act, 2016). The purpose of the Early Learning Collaborative Act was to provide funding for local communities to establish, expand, support, and facilitate successful early childhood education and development services (Guilfoyle, 2013). The 2013 Mississippi Legislature appropriated $3 million for implementation of the Early Learning Collaborative Act, which resulted in the first-ever state-funded Pre-Kindergarten program in Mississippi (Mississippi Department of Education, Office of Elementary Education and Reading, n.d.)

In 2013, the Mississippi Legislature also passed the Literacy Based Promotion Act (2017) for the purpose of improving the reading skills of Kindergarten and first

through 3rd-grade students enrolled in public schools with the goal of students exiting 3rd-grade with the ability to read at or above grade level. According to the Mississippi Department of Education (MDE; 2017), the Literacy-Based Promotion Act placed an emphasis on grade-level skills as students progressed from Kindergarten and first through 3rd-grade. Students not reading on the MDE mandated 3rd-grade state assessment cannot be promoted to 4th-grade unless the student qualifies for a good cause exemption (MDE, 2016b).

According to the MDE, Office of Student Assessment (2014), the Renaissance Learning, Inc. STAR Reading Assessment was selected as the test to measure literacy student achievement gains at the end of 3rd-grade during the 2014-2015 and 2015-2016 school years. The MDE Mississippi Assessment Program 3rd Grade Reading Summative Assessment was used to measure literacy achievement gains at the end of 3rd-grade in the 2016-2017 school year (MDE, 2017). The STAR Early Literacy Assessment and the Mississippi Assessment Program 3rd Grade Reading Summative Assessment were administered in a testing environment as prescribed by the MDE, Office of Student Assessment (2016).

Statement of Problem and Purpose

The purpose of this research was to determine if a Title I, Part A Pre-Kindergarten program did or did not have an impact on the later academic achievement of children in a rural, high poverty, high minority, public school district in Mississippi. Results from the study can provide educators and policymakers with data to align resources to deliver a more efficient education program. Additionally, the data can provide educators with pertinent information to review and revise early childhood procedures and practices,

which will assist schools and districts with the ability to provide high-quality learning opportunities for future students.

Mississippi was identified as a state with a weak education system (Lynch, 2014). As of 2016, Mississippi continued to remain at or near the bottom on a national performance of education survey (Education Week Research Center, 2016). Bernardo (2016) outlined the best and worst states for Kindergarten through grade twelve education; the researcher made a connection between an individual's education and future earning potential. The ranking was based on factors such as dropout rate, student/teacher ratios, test scores, and school safety indicators (Education Week Research Center, 2016). Mississippi's public education system was ranked by the Education Research Center as number 50 overall and was ranked number 46 for spending on public education. The Education Research Center labeled Mississippi as a state with low spending on education and a weak education system.

In 2015, Mississippi's public schools made progress on the National Assessment of Educational Progress, as evidenced by its achievement of a second-place tie for making significant gains on the tests in reading and mathematics (National Assessment of Educational Progress, 2016). Mississippi's State Superintendent of Education, Dr. Carey Wright, stated, "Mississippi is leading the nation in gains on the 4th grade NAEP [National Assessment of Educational Progress] assessment" (Wright, 2015, para 3). Despite improvements in the National Assessment of Educational Progress (NAEP) statewide assessment, the Associated Press (2016) reported Mississippi as the lowest-performing state in the nation. NAEP (2016) reported the average score for Mississippi's public school 4th-graders scores on the 2015 reading assessment was 214,

seven points below the national average of 221. According to the National Center for Education Statistics (2017), the 2015 NAEP national average reading scores of students in high-poverty schools were lower in comparison to their peers in every school not designated as a high-poverty school. Furthermore, the achievement gaps were not measurably different from the gaps identified in the period between 2005 and 2013. The Parents' Campaign, Research and Education Fund (2016), noted Mississippi had a higher percentage of students in poverty than other states, and the percentage of students living in poverty affected the state's overall rankings on NAEP. Although Mississippi showed an upward trajectory on NAEP reading and mathematics assessments at grades four and eight, Mississippi's two largest subgroups, African American students, and low-income students, made gains as well; however, both groups of students scored between 20 and 30 points below their Caucasian and non-poverty-stricken peers (Stroh, 2015).

Research Questions

The primary research question addressed in this study was, Does participation in a Title I, Part A Pre-Kindergarten have a significant effect on the 3rd Grade Reading Summative Assessment performance of children in a rural, high poverty, high minority, public school district in Mississippi?

The study was guided by the following research questions:

1. Are there significant differences between Pre-Kindergarten participants' and non-participants' achievement as measured by performance on the MDE's statewide 3rd Grade Reading Summative Assessment, given at the conclusion of 3rd-grade for the 2014-2015, 2015-2016, and 2016-2017 school years?

2. Are there significant differences between female Pre-Kindergarten participants' and non-participants' achievement as measured by performance on the MDE 3rd Grade Reading Summative Assessment, given at the conclusion of 3rd-grade for the 2014-2015, 2015-2016, and 2016-2017 school years?
3. Are there significant differences between male Pre-Kindergarten participants' and non-participants' achievement as measured by performance on the MDE 3rd Grade Reading Summative Assessment, given at the conclusion of 3rd-grade for the 2014-2015, 2015-2016, and 2016-2017 school years?
4. Are there significant differences between Pre-Kindergarten participants' and non-participants' school attendance rates as measured by cumulative attendance data at the conclusion of 3rd-grade for the 2014-2015, 2015-2016, and 2016-2017 school years?

Rationale

Landmark Pre-Kindergarten programs, such as the Abecedarian Project, the High/Scope Perry Preschool Program, Head Start, and the Chicago Child-Parent Centers have been studied extensively (Isaacs, 2008). At the time of implementation, all landmark Pre-Kindergarten programs had low student to teacher ratios, were lauded as high quality, and were well funded (High/Scope Educational Research Foundation, 2017; Schweinhart, Barnes, & Weikart, 1993; Schweinhart, Weikart, & Larner, 1986; United States Department of Health & Human Services, Administration for Children & Families, n.d.; University of North Carolina at Chapel Hill, n.d.). Although the number of Pre-Kindergarten programs has increased, much less is known about the effects of

universal Pre-Kindergarten programs and their impact on a student's academic achievement in later grades. This study contributes to the gap in research.

The efficacy of Pre-Kindergarten programs has continued to be questioned (Rodrigue & Reeves, 2016). While Dickinson and Porche (2011) reported a persistent increase in achievement gains and school readiness, Rodrigue and Reeves (2016) reported the initial increase in achievement gains and school readiness of students fade as they progress through the early school years. This is the case for the Pre-Kindergarten program this study analyzed. Although the program has been in operation for over six years, little to no empirical data have been analyzed to determine the effectiveness of the district's Pre-Kindergarten program. Additionally, while the number of Pre-Kindergarten classrooms expanded from two to three, data were not analyzed to determine if the program increased children's readiness for Kindergarten or if the Pre-Kindergarten program had a significant impact on increased academic achievement in the later grades. This study will become the first formal, data driven analysis of the district's Title I, Part A Pre-Kindergarten program.

This study is significant because the results from the study will provide school and district administrators with data needed to make well-informed decisions related to the efficacy of using Pre-Kindergarten programs to increase students' academic achievement. The results will add to the body of knowledge of Pre-Kindergarten programs. More specifically, the results will add to the body of knowledge of Pre-Kindergarten programs in Mississippi, especially programs in rural, high minority, high poverty, public school districts.

Study Delimitations

The study was designed to establish specific parameters. The student data collection was limited to the 2014-2015, 2015-2016, and 2016-2017 school years. The only assessment data used to measure later academic achievement of children were from the 3rd Grade Reading Summative Assessment.

Sampling was not employed in the study. All students who took the 3rd Grade Reading Summative Assessment were included in the study. Assignment to sample groups was based on student participation or non-participation in the district's Title I, Part A Pre-Kindergarten program. The criteria for assignment to the Pre-Kindergarten participant group was attendance in the school district's program for a minimum of one-half the school year.

The study did not include Pre-Kindergarten programs outside the subject school district and its individual Title I, Part A Pre-Kindergarten program.

The study did not include other variables shown to have an impact on student achievement, such as Pre-Kindergarten program quality, teacher quality, educational attainment of parents, or parental involvement (Cascio & Schanzenback, 2013; Yoshikawa et al., 2013). Additionally, it was not determined whether students received additional academic assistance, such as tutoring or at-home academic instruction beyond the school day.

Definition of Terms

The following definitions are provided for clarification of terminology used in this research study. Terms may be unique to this study.

1. Early Learning Collaborative: a district or countywide council that writes and submits an application to participate in the voluntary Pre-Kindergarten program. An Early Learning Collaborative is comprised, at a minimum, of a public-school district and/or a local Head Start affiliate if in existence, private or parochial schools, or one or more licensed childcare centers. Agencies or other organizations that work with young children and their families may also participate in the collaborative to provide resources and coordination even if those agencies or organizations are not Pre-Kindergarten providers (Early Learning Collaborative Act, 2016).
2. Head Start Programs: serve children ages birth to five from low-income families in a comprehensive manner to promote school readiness. Programs have been delivered in a variety of service models. All programs have included early learning, health, and family well-being services (United States Department of Health & Human Services, Administration for Children & Families, n.d.).
3. Mississippi Academic Assessment Program (MAAP): contains all assessments required by the MDE (MDE, Office of Student Assessment, 2016).
4. Mississippi Academic Assessment Program (MAAP),3rd Grade English Language Arts Assessment: designated in 2016-2017 as the 3rd Grade Reading Summative Assessment replacing the MKAS^2 assessment (MDE, Office of Elementary Education and Reading, 2016). Results from the assessment were used to determine whether a student would be promoted or retained in the 3rd-

grade as mandated by the Literacy-Based Promotion Act (Literacy-Based Promotion Act, 2017).

5. MKAS^2 Reading Assessment: an assessment developed by Renaissance Learning Inc. (Renissance Learning Inc, 2013) and required by the MDE to be administered to all students enrolled in 3rd-grade at the time the assessment was administered in the 2014-2015 and 2015-2016 school years. Results from the assessment were used to determine whether a student would be promoted or retained in the 3rd-grade as mandated by the Literacy-Based Promotion Act (Literacy-Based Promotion Act, 2017). The assessment was no longer used as the primary assessment for compliance with the Literacy-Based Promotion Act beginning with the 2016-2017 school year; however, it was designated as the alternative assessment beginning in the 2016-17 school year (MDE, Office of Elementary Education and Reading, 2016).
6. Pre-Kindergarten child: any child who has not entered Kindergarten and will reach the age of four on or before September 1 of a school year (Early Learning Collaborative Act, 2016).
7. Title I, Part A: a function of the Elementary and Secondary Education Act, as amended. Title I, Part A provides financial assistance to school districts and schools with high numbers or high percentages of children from low-income families to help ensure that all children meet the state's challenging academic standards. The federal funds are currently allocated through a statutory formula based primarily on census poverty estimates and the cost of education in each state (United States Department of Education, Office of Elementary

and Secondary Education, 2015).

Conceptual Framework of the Study

Figure 1 provides a visual illustration of the conceptual framework for the study. Components of the study include: (a) Pre-Kindergarten participants' achievement scores on MDE's 3rd-grade assessment for reading, (b) non-Pre-Kindergarten participants' achievement scores on MDE's 3rd-grade assessment for reading, (c) cumulative school attendance rates for students who participated in the Pre-Kindergarten program, and (d) cumulative school attendance rates for students who did not participate in the Pre-Kindergarten program.

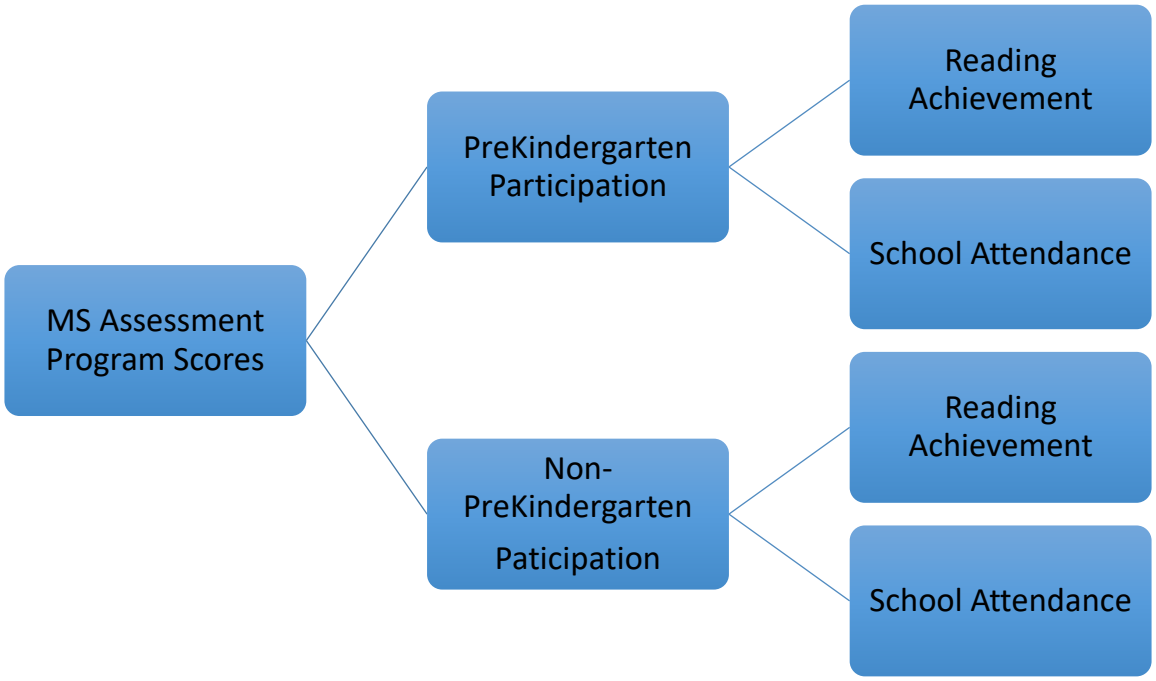

Figure 1. Conceptual framework of the study

Organization of Study

This study is organized into five chapters. Chapter I provides an introduction to the study. It is composed of: (a) an introduction, (b) statement of the problem, (c) questions to be answered, (d) rationale for the study, (e) study limitations, (f) study delimitations, (g) definitions of terms, and (h) the conceptual framework of the study.

Chapter II is composed of a review of the related literature and focuses on (a) an introduction, (b) Pre-Kindergarten in Mississippi, (c) landmark Pre-Kindergarten programs, (d) the state of Pre-Kindergarten programs, (e) quality of Pre-Kindergarten programs, (f) characteristics of quality Pre-Kindergarten programs, (g) funding for Pre-Kindergarten programs, (h) benefits of Pre-Kindergarten programs, and (i) financial implications of Pre-Kindergarten programs.

Chapter III identifies the research design and methodology used in the study. It contains: (a) a detailed description of the research design; (b) the selection of participants, (c) procedures for data collection, and (d) data analysis methods used to determine research findings and conclusions.

Chapter IV presents the findings obtained through data analysis. Quantitative methods were used to analyze the data for each research question. The results are presented in terms of statistical significance.

Chapter V includes a discussion of the findings from the study.

CHAPTER II

LITERATURE REVIEW

Introduction

This chapter provides a review of the relevant literature on Pre-Kindergarten programs. It focuses on (a) Pre-Kindergarten in Mississippi (b) landmark Pre-Kindergarten programs, (c) the state of Pre-Kindergarten programs, (d) quality of Pre-Kindergarten Programs, (e) characteristics of quality Pre-Kindergarten programs, (f) funding for Pre-Kindergarten programs (g) benefits of Pre-Kindergarten programs, and (h) financial implications of Pre-Kindergarten programs. The chapter concludes with the significance of this study.

Policy and school reform leaders have worked to reform Kindergarten through grade 12 public school education for decades (The Pew Center on the States, 2011). As reported by the Center for Public Education (2012), many educators have discovered reform efforts in Kindergarten through grade 12 were often too little, too late. By the time many children entered Kindergarten, they were already far behind their peers in skills and other measures of school readiness (Bohrnstedt, 2013). The cost of repairing public education comes at a tremendous expense and with limited success as children progress through elementary, middle, and secondary schools (Center for Public Education, 2012; The Pew Center on the States, 2011). This realization has led many states to intervene early, rather than waiting until the educational gaps materialize (Gormley et al., 2005;

Heckman, 2008; Henry et al., 2004; Huang, Invernizzi, & Drake, 2012). As a result, many states have expanded their financial investments into Pre-Kindergarten programs and services to better prepare children for school success (Center for Public Education, 2012). Pre-Kindergarten has emerged as a promising strategy to promote school readiness and close achievement gaps in elementary school and beyond (Leak et al., 2010).

The Pew Center on the States (2011) has identified two common flaws in educational reform efforts. One flaw is attempting to close student achievement gaps long after they have surfaced, while the other flaw is an indifference to Pre-Kindergarten, despite its reported ability to change the trajectory of a child's learning by serving as a catalyst for higher performance throughout school (Barnett, 2010; Barnett & Masse, 2007; Bartik, Gormley, & Adelstein, 2012; High/Scope Educational Research Foundation, 2017). Reform efforts centered on catch-up are not a long-term strategy for success (Huang et al., 2012). Replication of proven early education programs coupled with efforts to maximize the impact of early education and other complementary reforms hold the promise of future success (Heckman, 2008).

While education reform efforts have long been underway, the expansion of publicly funded early childhood education continues to be a prominent debate in the United States (Yoshikawa 2013). The vigorous debate surrounds the merits of preschool education. Researchers (Ramey & Ramey, 1999; Reynolds et al., 2011; Rodrigue & Reeves, 2016) study topics including:

1. Do early skills matter?
2. What are the short- and long-term effects of preschool programs on children's school readiness and life outcomes?

3. What is the impact of program quality?
4. Which children benefit from preschool?
5. What are the costs versus benefits of early childhood education?

Children's levels of performance in school, their school experiences as a whole, and their accomplishments beyond school are set early in life when their brains are developing and building the capacity to learn and formulate complex ideas (Bohrnstedt, 2013; Shonkoff & Philips, 2000). The foundation of brain development in a child's early years determines lifelong brain development potential (Yoshikawa et al., 2013).

The Center on the Developing Child (n.d.) reports that during the time from conception until entering Kindergarten at age five, brain development occurs at a rapid pace, far exceeding brain growth at any other stage of life. During the early years of brain growth and development, the brain is also quite vulnerable to both nurture and nature experiences and stimuli (McDevitt & Ormrod, 2010).

High quality Pre-Kindergarten education provided to children during this crucial time of brain development cultivates the essential skills children need for success (Shonkoff & Philips, 2000). Nobel Laureate economist James J. Heckman (2008) explains, "Skill formation is dynamic in nature. Skill begets skill; motivation begets motivation. … The longer society waits to intervene in the life cycle of a disadvantaged child, the more expensive it is to remediate disadvantage." (p. 1)

Before age five, a solid cognitive and emotional foundation should be built to ensure a child has the aptitude to obtain high levels of achievement in successive grades (The Pew Center on the States, 2011).

Early childhood development encompasses a wide range of developmental skills and tasks. Researchers often group these developmental skills and tasks into distinct domains (Shonkoff & Philips, 2000). Early language, literacy, and math are grouped into the cognitive domain, while the social-emotional domain is composed of developing skills and tasks such as empathy, controlling and expressing emotions, and socialization skills (Yoshikawa et al., 2013). The early years are a time for children to learn persistence, attention, and executive functions, which includes voluntary control of attention and behavior (Center on the Developing Child, 2012).

According to the National Scientific Council on the Developing Child (2007), there are notable differences between children's skills before Kindergarten entry. The differences between the development of children are closely related to their social and economic circumstances, these differences are indicators of subsequent academic performance (McDevitt & Ormrod, 2010). According to Shonkoff and Phillips (2000), it is essential the gaps in skills and tasks children must master are identified and addressed early, allowing children to begin school with a solid foundation for academic achievement, which will ultimately affect their achievement as children progress from one grade to the next.

Preschools place a primary emphasis on socialization and general cognitive development (Chambers, Cheung, & Slavin, 2016). As children transition from home to school, early childhood providers and educators have encouraged them to play dress-up, sing, build with blocks, participate in dramatic activities, and engage in art activities (Roopnarine & Davidson, 2015). Cognitive child development theorist Jean Piaget (1952) and social cultural theorist Lev Vygotsky (1987) strongly reinforced the idea that

cognitive and social development are the appropriate goals of early childhood education, including self-chosen activities, interactions among children, as well as experiencing make-believe, construction, art, and music.

Federal Preschool Initiatives

In his 1964 Annual Message to Congress on the State of the Union, President Lyndon B. Johnson launched his historic War on Poverty (Johnson, 1964). The War on Poverty yielded two program initiatives which continue to have a direct impact on education today. The Elementary and Secondary Education Act of 1965, which established the Title I, Part A program to provide supplemental funds to school districts with high percentages of impoverished students, and the Economic Opportunity Act of 1964, which created Head Start, (Matthews, 2014) were his legacy. The Elementary and Secondary Education Act of 1965, and its subsequent reauthorizations, is the most significant federal law to impact elementary and secondary schools; it continues to be a major contributor to the current discourse surrounding Pre-Kindergarten policy and funding (Center for Public Education, 2016; Zascavage, 2010).

According to the United States Department of Education (United States Department of Education, Office of Elementary and Secondary Education, 2012), Title I, Part A provides financial assistance to schools and districts with high percentages of children from low-income families to help meet the state's challenging academic standards. Title I, Part A funds are based on census data, poverty estimates, and the cost of education within the state (Sonnenberg, 2016).

Cowan (2009) noted schools and districts are allowed to use Title I, Part A funds to provide Pre-Kindergarten services to children enrolled in the school or district's

attendance zone. In the event all preschool-age children in the school or district's attendance zone cannot be served, Title I, Part A guidelines require schools and districts to develop appropriate selection criteria to determine which children are served (Manasevit, 2013). The children selected for the program must be those who are most at-risk of failing to meet the state's challenging academic standards (United States Department of Education, Office of Elementary and Secondary Education, 2012). The school or district is required to use selection criteria composed of multiple, educationally-related measures, such as developmentally appropriate measures of child development, teacher judgment, and interviews with parents to determine which children are most in need of services (LRP Publications, 2016). Additionally, family income may be used as a one of the factors to determine the most academically at-risk children (Sweeney, 2016).

In 2013, President Barack Obama demonstrated his commitment to preschool by introducing his Preschool for All initiative during his State of the Union Address (Politico, 2013). In the State of the Union Address, President Obama proposed a series of new investments to provide high quality preschool for every child in America (Forbes, 2013). According to Whitehurst (2013a), the first proposed investment was a state-federal partnership which would allow school districts and other partners to provide Pre-Kindergarten to all four-year-olds in families at or below 200% of the poverty line. As part of the proposed investment, teachers in the program would have the same level of training and education as teachers in schools serving students in Kindergarten through Grade 12. The second proposed investment would provide a massive expansion to the Early Head Start Program, which provides services to vulnerable children ages zero to

three (The White House, Office of the Press Secretary, 2013). As noted by Matthews (2013), the third proposed investment would be an expansion of the Nurse Family Partnerships Program, a program where nurses provide in-home services to promote good health and parenting to families from pregnancy through the child's second birthday.

Landmark Pre-Kindergarten Programs

Three landmark Pre-Kindergarten programs initiated in the 1960's have helped introduce early childhood education in the United States. They are the High/Scope Perry Preschool Program, Head Start, and the North Carolina Abecedarian Project (Center for Public Education, 2012). Later the Chicago Child Parent Centers also became a landmark program (Hechinger Report, 2010). According to the Center for Public Education (2012), all four programs target children from low-income families with the primary goal of improving school readiness and improved academic success throughout the children's school career. The foundational tenant of all four programs is to provide children with learning activities and related services not found within their home environments (High/Scope Educational Research Foundation, 2017; Schweinhart et al., 1993; Schweinhart et al., 1986; United States Department of Health & Human Services, Administration for Children & Families, n.d.; University of North Carolina at Chapel Hill, n.d.).

Perry Preschool Program

The Ypsilanti School District, Division of Special Services, developed the Perry Preschool Program between 1962 and 1967 (High/Scope Educational Research Foundation, 2017; Reynolds, 2000; Schweinhart et al., 1993). The program was designed

as a 2-year intervention program for extremely disadvantaged three-and-four-year-old African American children living in Ypsilanti, Michigan (Cascio & Schanzenback, 2013). The Perry Preschool Program placed a stronger emphasis on education than Head Start (Schweinhart et al., 1993). The program was based on High/Scope's participatory learning approach, the focus of which was cognitive and social development (Epstein, 2007).

According to Schweinhart (2003), "The High/Scope Perry Preschool Study is one of the pioneering studies of the preschool program research tradition" (p. 2). This piece of research is one of the first to study the effects of preschool education on children living in poverty (Cascio & Schanzenback, 2013). The study is also one of the few studies involving random assignment of children who received the preschool treatment and a control group of children who did not participate in the preschool program (High/Scope Educational Research Foundation, 2017). The High/Scope Perry Preschool Program research is a longitudinal study, which encompasses a study of the participants through age 40 (Schweinhart et al., 2005). Schweinhart (2003) describes the study as:

> One of the first to identify lasting program effects on participants' later educational achievement, economic success, and avoidance of criminal activity; and to find a return on public investment in the program. This study was one of the first to take its findings beyond professional circles and into the public debate (p. 2).

As reported by Schweinhart et al. (1993), the High/Scope Educational Research Foundation embarked on a longitudinal study of the Perry Preschool Program participants from 1962 to 1967 to determine the effects of high quality preschool programs on

children living in poverty and identified as at-risk of school failure. As stated by Schweinhart, et al (2005), 123 African American three and four-year-olds formed the study cohort. There were 58 children randomly assigned to the group who received the preschool program. There were 65 children who did not receive the preschool program and became the control group. All children who participated in the Perry Preschool Program were evaluated using the Stanford-Binet Intelligence Test (Terman & Merrill as cited in Schweinhart, 2003, p. 3). Children selected for the study scored in the range of 70 to 85 on the initial screening test for the Intelligence Quotient (Heckmam, Moon, Pinto, Savelyev, & Yavitz, 2010). Perry Preschool Program staff determined the poverty level of the children based on: the parents' number of years of schooling, rooms per person in the children's homes, and the parents' occupational levels (High/Scope Educational Research Foundation, 2017; Schweinhart, 2003). The results of the longitudinal data allowed researchers to analyze program effects decades after the preschool program ended (Schweinhart, 2016).

Further, the High/Scope Educational Research Foundation (2017), the foundation of the Perry Preschool Program, was comprised of two primary components. According to Child Trends (2012), in component one, the children attended class for two and one-half hours each day from October to May, where the High/Scope curriculum was delivered by highly trained teachers to groups of five to six children. Instruction focused on the areas of logic and mathematics, language and literacy, music and movement, creative representation, social relations, and initiative. As reported by Schweinhart et al. (1986), the second component was comprised of parental outreach whereby teachers visited in the children's home for one and one-half hours each week to demonstrate and

explain at-home activities parents could to do with their children to help their children develop academic skills. Parents were shown how to read to children, develop counting activities, and create activities that increase vocabulary (High/Scope Educational Research Foundation, 2017; Schweinhart et al., 1993; Schweinhart et al., 1986).

The Perry Preschool Program was designed to address the needs of children living in poverty (Schweinhart et al., 1993). Heckman et al. (2010) reported the high-quality preschool program resulted in lifetime impacts. On measures of educational performance, participants in the Perry Preschool Program scored significantly higher than non-participants in a general literacy test at age 19 and at age 27, as well as on an overall school achievement test at age 14, which had subtests in reading, language, and math (Schweinhart, 2003). However, on several IQ tests and language tests, program participants scored higher than non-participants until age seven, after which the scores of the participants and non-participants converged (High/Scope Educational Research Foundation, 2017).

Studies of the Perry Preschool were two-dimensional and included research on both the academic achievement of the participants as well as the economic impact of the program. As reported by Schweinhart (2003), Perry Preschool participants earned significantly more money, were employed at higher rates, and were more likely to own their homes when compared to their non-participant peers. Additionally, at age 27, 59% of the program participants received welfare assistance compared to 80% of the non-participants (Schweinhart et al., 1993). At age 40, adults who had attended the program as children were more likely to have graduated from high school, were more

likely to hold a job, receive higher earnings, and had committed fewer crimes than adults who had not attended preschool (Schweinhart et al., 2005).

Crime rates were analyzed to determine if preschool participation was a crime deterrent (Lally, Mangione, & Honig, 1988; Reynolds, Temple, Robertson, & Mann, 2001; Schweinhart, 2003). Although crime rates were high, there was a significant difference between program participants and non-participants (Belfield, Nores, & Barnett, 2006). At age 28, program participants had been arrested an average of two and three-tenths times, compared to non-participants with four and six tenths times, only 7% of the program participants had been arrested five or more times as opposed to 35% of the non-participants (Schweinhart, 2003; Schweinhart et al., 1993). According to Wilson (2000), 49% of the males who did not attend the program had been arrested five or more times, while only 12% of the males who attended the program had been arrested five or more times. When data were analyzed for illegal drug activity, it was found members of both groups were arrested for illegally selling drugs; although only 7% of the preschool participants were arrested compared to 25% of the group who did not attend the preschool program (Schweinhart, 2003).

Head Start Program

In 1964, President Lyndon B. Johnson launched his "War on Poverty" (Johnson, 1964). In his 1964 State of the Union Address, President Johnson stated, "Our aim is not only to relieve the symptoms of poverty, but to cure it and, above all, to prevent it" ("Section III," para 10). According to Matthews (2014), four pieces of legislation were instrumental in President Johnson's plan to eliminate poverty, one of which was The Economic Opportunity Act of 1964 (University of Virginia, Miller Center, Rotunda,

2014). The act established several programs and offices of oversight, including the Office of Economic Opportunity, which served as the White House catalyst responsible for implementing President Johnson's War on Poverty (Matthews, 2014). Additionally, Head Start was created as one of the forces to attack and eradicate poverty (National Head Start Association, n.d.a).

According to the National Association for the Education of Young Children (n.d.), since its inception, Head Start continues to maintain its original goal of improving the school readiness of children from low-income families. Head Start utilizes the "whole child" model for program services (National Head Start Association, n.d.a). The Encyclopedia of Children's Health (n.d.) notes the services children from low income families receive which includes: preschool education, nutrition services, and medical, dental, and mental health care services. Additionally, Head Start strives to provide services in a system sensitive to each family's cultural and ethnic heritage and contains a provision to work with parents to help them learn strategies to foster their child's development (Parent Companion, n.d.).

When the United States Congress reauthorized Head Start in 1998, it mandated the United States Department of Health and Human Services determine the impact of Head Start on the children it served with the additional stipulation the impact be determined from a national perspective and not on isolated programs (National Head Start Association, n.d.b). Specifically, Congress mandated Head Start data be analyzed in two specific areas (United States Department of Health and Human Services, Administration for Children and Families, n.d.). The first area was to determine the impact of Head Start on children's school readiness and its impact on parent practices

that fostered child development. The second area was to determine when and how Head Start services were implemented that had the greatest impact, what services created the greatest impact, and which children benefited the most. The Advisory Committee on Head Start Research and Evaluation (1999) directed a research project to answer these questions through which they collected and analyzed data gathered on children when they were in preschool, Kindergarten, and first grade. By the time the Head Start Impact Study was conducted, Head Start had been in existence for 40 years (Zigler & Styfco, 2010)

According to researchers (Moiduddin, Aikens, Tarullo, West, & Xue, 2012), the Head Start Impact Study included almost 5,000 children from 84 Head Start Agencies who were selected based on their representation of the nationwide Head Start Program. The study comprised newly entering, eligible three and four-year-old children separated into either a treatment group or a control group (National Head Start Association, n.d.b). According to the Advisory Committee on Head Start Research and Evaluation (1999), children in the treatment group were provided access to Head Start Program services, while the children in the control group were not provided with access to Head Start services. Additionally, parents were allowed to enroll their children in other early childhood programs and services (United States Department of Health & Human Services, Administration for Children & Families, n.d.). Data collection began in the fall of 2002 and followed children through the spring of their first-grade year (Puma et al., 2012). Due to the differences in the demographic make up of the groups, the Advisory Committee on Head Start Research and Evaluation (2012) evaluated the three-year-old and the four-year-old groups separately.

Researchers (Garces, Currie, & Thomas, 2002; Puma et al., 2012) reported test score effects of children who participated in Head Start during the 1960s through the 1980s were found not to be statistically significant within a few years after children left the program. By the time the participants were in 3rd-grade, their test scores faded to a fraction of their initial levels and were no longer statistically different from zero when compared to children who did not attend Head Start (Johnson, 2013). Even though achievement scores faded, children who attended Head Start were reported to have received other benefits (United States Department of Health & Human Services, Administration for Children & Families, 2010). According to Ludwig and Miller (2007), children who attended Head Start attained higher levels of education. Garces et al. (2002) reported Head Start participants were less likely to engage in criminal behavior and more likely to experience an increase in educational attainment. According to Deming (2009), the effects of Head Start on adult outcomes predicted an average 11% increase in earnings. Schanzenbach and Bauer (2016) found Head Start improved educational outcomes, including a higher probability participants would graduate from high school, attend college, and complete a postsecondary degree or certification program.

North Carolina Abecedarian Project

North Carolina at Chapel Hill described the Abecedarian Project as, "one of the world's oldest and most oft cited early childhood education programs" (University of North Carolina at Chapel Hill, n.d., para 1). The program was deemed "revolutionary" due to its approach (Campbell, Ramey, Pungello, Sparling, & Miller-Johnson, 2002). According to Campbell et al. (2008), the Abecedarian Project differed from the Perry Preschool Program and Head Start in its work, which began with children in early

infancy and continued through school entry. The early intervention into the children's lives provided them with exposure to high quality childcare settings for five years (Campbell et al., 2012). Housed at one site, the program served children born between 1972 and 1977 (University of North Carolina at Chapel Hill, n.d.).

When the Abecedarian Project began in 1972, Dr. Craig T. Ramey, lead researcher for the project, described it as a method of bringing researchers from many disciplines together with the purpose of demonstrating how developmental retardation of disadvantaged children could be prevented (Ramey et al., 1974). Through the project, researchers would also be able to explain how biological and psychological processes responded to the techniques used to prevent retardation (Campbell et al., 2014).

According to Ramey et al. (1974), researchers developed a High Risk Index for selection of families into the program. Once children were born, they were randomly assigned to either the treatment group or the control group (Campbell et al., 2012). All children in both groups received the following services: social, medical, nutritional, transportation, and payment for participation (Campbell et al., 2014). Social services included goods, services, and guidance in areas such as how to obtain food, clothing, family planning, and other service areas believed to help keep the family intact (Ramey & Ramey, 1999). Nutritional services were provided to the control group in the form of unlimited formula in year one, with additional plans for the following years (Child Trends, n.d.). The treatment group was provided breakfast, lunch, and an afternoon snack at the child development center (University of North Carolina at Chapel Hill, n.d.).

Ramey et al. (1974) reported the primary technique to prevent developmental retardation of disadvantaged children was a high quality educational intervention in a

childcare setting from infancy through age five. The treatment group attended the Frank Porter Graham Child Development Center each weekday, year-round, which operated from 7:45 a.m. until 5:30 p.m. each day the center was open (University of North Carolina at Chapel Hill, n.d.). A learning path was designed for each child to ensure individual needs were met (Ramey et al., 1974). According to the researchers (Campbell et al., 2014), each week parents were given a packet of activities and curriculum materials to use at home with their child for a minimum of fifteen minutes each day. The teacher-to-child ratio was quite small with a ratio of one teacher to three children for infants, and a ratio of one teacher to six children as children got older (Child Trends, n.d.).

The University of North Carolina at Chapel Hill (n.d.) identifies four key components that compose the "Abecedarian Approach," which are language priority, conversational reading, enriched caregiving, and back-and-forth activities between the adult and child. These components are the foundational elements used to develop social, emotional, cognitive, and physical skills (Ramey, Sparling, & Ramey, 2012). The Abecedarian Approach consists of a series of learning activities to support age-appropriate development across the infancy, toddler, and preschool years (Campbell & Ramey, 1994). As noted in 1978 by The University of North Carolina at Chapel Hill (n.d.), after the researchers completed formative evaluations, tested the curriculum, and developed more than 200 games, publication of the registered trademark LearningGames book series occurred with the fitting description as the first scientifically-validated curriculum for infants and toddlers. Currently it is marketed by Teaching Strategies for Early Childhood and has continued to be updated with research to show its effectiveness

(Teaching Strategies, n.d.). According to the company, it is used in a variety of early childhood settings, such as day cares, private homes, Head Start, and preschools.

The University of North Carolina at Chapel Hill (n.d.) identified the participants in the Abecedarian Project in four cohorts of children born between 1972 and 1977. A total of 111 children participated in the project (Ramey & Ramey, 1999). Although the project was not designed to target a specific ethnicity, most of the children were African American (Ramey et al., 1974). According to the researchers, all children lived in Orange County, North Carolina, and shared common familial conditions such as poverty, young mothers, and low parental education.

Extensive studies have been conducted on the Abecedarian Project. When the Abecedarian studies began in 1972, almost all of the children scored in the normal IQ range (Sparling, n.d.). By 48 months of age, the children who received project services remained in the normal range, while more than half of the children who did not receive services fell into the below normal IQ range (Martin, Ramey, & Ramey, 1990). Children who did not receive services were almost twice as likely to have received one or more years of special education services by age 15 (Ramey & Ramey, 1999). The children who participated in the Abecedarian Program scored higher on mathematics and reading achievement tests through elementary and secondary school, and were less likely to have been retained in those grades (University of North Carolina at Chapel Hill, n.d.). By age 21, almost 70% of the children who participated in the Abecedarian Program, as opposed to 40% of the children who did not, either enrolled in a 4-year college program or were employed in a high-skill job (Campbell et al., 2002). Campbell (2014) found the children

in the Abecedarian Project who received early care and education through age five had better physical health in their mid-30's than did the children who did not receive services.

Chicago Child Parent Center Program

President Johnson's "War on Poverty" (Johnson, 1964) contains another key piece of legislation in addition to the Economic Opportunity Act of 1964: the Elementary and Secondary Education Act of 1965, as amended. The Elementary and Secondary Education Act of 1965, as amended, established the Title I, Part A program which provides supplemental funds to school districts with high percentages of students living in poverty (United States Department of Education, Office of Elementary and Secondary Education, n.d.).

According to the Chicago Public Schools (2016), in 1967, the Chicago Public School District was the first school district in the nation to allocate Title I, Part A funds for preschool programs. After Head Start, the Chicago Child Parent Center is the second oldest federally funded preschool in the nation and is the first comprehensive Pre-Kindergarten through 3rd-grade program to be federally funded (Reynolds, 2000).

In the mid 1960s, Dr. Lorraine Sullivan, District 8 Superintendent, designed an early childhood education program to address the three major problems facing Chicago's west side: low attendance rates, low student achievement, and lack of parental engagement with the schools (Chicago Public Schools, 2016). As noted by the Chicago Public Schools, to address these issues, the Child-Parent Education Centers (CPC) were established in May 1967 and served children from the most disadvantaged areas of Chicago.

The Chicago Longitudinal Study investigated the effect the CPCs had on children who attended the programs (University of Wisconsin-Madison, Waisman Center, 2000). According to Reynolds, Temple, Robertson, and Mann (2002), the purpose of the longitudinal study was to determine the educational and social development of the children who grew up in the high-poverty neighborhoods where CPCs were located and participated in the CPC. African American children accounted for 93% of the children in the study (Chicago Public Schools, 2016). According to the University of Minnesota, Institute of Child Development (2013), of the 1,539 children in the study, 1,150 received services from the CPC preschool programs and/or Kindergarten programs in 1973-1975 and 1975-1976, respectively. The remaining 389 children who did not participate in a CPC Program were from similar neighborhoods, of the same age, and participated in a Chicago Public School District alternative full-day Kindergarten program (Reynolds et al., 2002).

Chicago Public Schools (2016) described the CPC Program as a center-based early intervention program that provided comprehensive services to children and parents. The comprehensive services were a structured curriculum focused on academic achievement, parental involvement, individual attention, and health and nutrition services (Besharov, Germanis, Higney, & Call, 2011). Parents were usually required to engage in a minimum of one, half-day of parental involvement activity each week, which ranged from classroom involvement activities to parental enrollment in adult education classes (Reynolds et al., 2011). Although a uniform curriculum was not used, there was a child-centered approach to literacy as well as social and cognitive development (Rice University, Susanne M. Glasscock School of Continuing Studies, 2012). Reynolds (2000)

described the CPC Program as a half-day program, while the school district's Kindergarten program was either a half-day or a full-day program. Another key component of the CPC Program was the student-to-teacher ratio (Chicago Public Schools, 2016). The CPC Program had a ratio of 17 students to one teacher and one teacher's aide; the Kindergarten and the primary grades had a ratio of 25 students to one teacher and one teacher's aide (University of Wisconsin-Madison, Waisman Center, 2000).

Reynolds (2000) conducted a longitudinal study of the CPC Programs and reported the following results:

1. Participants showed three months performance gains on cognitive school readiness.
2. At the end of 4th-grade, the CPC participants scored a grade equivalent of three and four tenths on reading and three and six tenths on math, whereas the children in the control group scored a grade equivalent of two and nine tenths on reading and three and two tenths on math.
3. At the end of sixth grade, reading and math scores were six and nine tenths and seven and zero tenths respectively for the CPC participants and six and five tenths and six and four tenths for the control group.
4. Children in the CPC program received special education services at lesser rates and were retained at lower rates than were children who did not receive CPC services.

Reynolds et al. (2001) reported the following results from their 15-year follow up study of the CPC Program:

1. CPC participants continued to outperform the comparison group by an approximate four months gain in reading and math.
2. CPC participants were still less likely to have been retained or to have received special education services when compared to the nonparticipants.
3. When the academic achievement of participants was compared, boys benefited the most in the areas of early school achievement and educational attainment, while girls had greater gains in math and reading as their age increased from 9 to 15.
4. Children from areas of Chicago where the low-income level was greater than 60% saw greater benefits on school achievement and educational attainment than did children in areas where the income level was not as low.
5. Children who attended CPCs with activities that were more structured and more teacher-directed performed better in school and were retained at lower levels than children who attended CPCs where activities were less structured and less teacher-directed.
6. At age 18, CPC participants had a 37% lower rate of juvenile arrest than non-participants.

State of Pre-Kindergarten Programs

Enrollments in public preschool programs have notably increased over the last 30 years (McFarland et al., 2017). The National Institute for Early Education Research (NIEER) developed criteria to identify state preschool programs (Barnett et al., 2012). According to Cascio and Schanzenback (2013), to be identified as a state public preschool program by the NIEER, the program must be funded, controlled, and directed

by the state, serve preschool age children, focus on early childhood education in a group learning environment, and be distinct from the state's system for subsidized child care. When the researcher applied the NIEER criteria to state programs for four-year-olds, four states with preschool programs subsidized with public funds were identified. Accordingly, the states and year the state first subsidized preschool programs were: California in 1965, New York in 1966, and both Maryland and Oklahoma in 1980. Between the period between 1980 and 2011, the number of state preschool programs increased rapidly (Barnett & Carolan, 2013). Between 1983 and 1987, 11 states started their first preschool programs (Cascio & Schanzenback, 2013). By 2010, 40 states provided some form of state funding for Pre-Kindergarten programs, but this number dropped to 39 in 2011 (McCann, n.d.).

McFarland et al. (2017) reported tremendous change in Pre-Kindergarten over the decade from 2001-2002 to 2011-2012. Barnett and Carolan (2013) found states served nearly 30% of all four-year-olds within each state and exceeded 30% when preschool special education programs were included in calculating the percentage of programs. By 2011-2012, state-funded Pre-Kindergarten programs served more than twice as many four-year-olds as Head Start, and more children than the total number of children at all ages served by Head Start (United States Department of Education, 2015).

Sanchez and Nadworny (2017) reported in 2016 NIEER identified state-funded Pre-Kindergarten programs in 43 states and in the District of Columbia and Guam. While nationwide state funding for Pre-Kindergarten programs increased, at the state level, some states experienced increased funding while others saw decreased funding (Diffey, Parker, & Atchison, 2017). With the recent rate of progress in the United States, NIEER

(2016) predicted it would take another 50 years to serve all four-year-old children from low-income homes in state Pre-Kindergarten programs, and 150 years to serve 75% of all four-year-olds.

Although the number of Pre-Kindergarten programs meeting NIEER criteria has increased, there is significant variation across state programs concerning children eligible to attend based on the children's ages and the target population (Barnett et al., 2016). According to Cascio and Schanzenback (2013), in most programs, four-year-olds are admitted, although three-year-olds make up approximately 13% of enrollment. The United States Department of Education (2015) reports the target population of preschool age children eligible to enroll in Pre-Kindergarten programs vary from state to state, and while most programs target children from low-income homes, the income threshold varies across states as well. Barnett and Carolan (2013) note some state programs target populations of children regardless of family income levels. However, according to Cascio and Schanzenback (2013), the target populations of children includes children with developmental delays, English Language Learners or Dual Language Learners, and children with other identifiable risk factors.

Even though universal access is only found in a few states, a number of states with state subsidized Pre-Kindergarten programs are making progress (Cascio & Schanzenback, 2013). Three states with universal access are Georgia, Oklahoma, and Florida. Georgia began universal access programs in 1995, Oklahoma's began in 1998, and Florida's began in 1999 (Barnett & Carolan, 2013).

Quality of Pre-Kindergarten Programs

Findings from the landmark preschool and Pre-Kindergarten programs show achievement and social-emotional gains which exceeded studies of later programs (Gormley et al., 2005; Huang et al., 2012). These programs were more expensive, had smaller student-to-teacher ratios, and had better trained staff when compared to most current preschool and Pre-Kindergarten programs (Huang et al., 2012). However, as noted by Barnett (2010), no current public preschool program has achieved the results of the landmark programs.

Barnett and Carolan (2013) provide insight into the quality of Pre-Kindergarten programs with their study, which describes a direct observation of quality over a national sampling of Pre-Kindergarten programs using the Early Childhood Environment Rating Scale-Revised edition (ECERS-R). The ECERS-R is designed to assess programs serving preschool through Kindergarten-aged children (Harris, Clifford, & Cryer, 2004). The ECERS-R assessment is based upon observation with a focus on factors such as interactions between staff, other adults, and children as well as interactions with the available resources (University of North Carolina at Chapel Hill, Frank Porter Graham Child Development Institute, n.d.). According to Barnett and Carolan (2013), only one in three classrooms serving four-year-old children rates at good or better on ECERS-R. As their results depict, Pre-Kindergarten children's learning is far greater in Pre-Kindergarten programs rating good or better in contrast to programs scoring low to moderate on the scale. Additionally, they report public Pre-Kindergarten programs are more likely to score good or better on the rating scale in comparison to private programs, which score low to moderate on the quality index.

State Pre-Kindergarten programs are very different in terms of access and standards of quality (Barnett et al., 2016). NIEER identifies 10 quality metrics to measure all Pre-Kindergarten programs (Barnett & Carolan, 2013). According to Cascio and Schanzenback (2013), the metrics are as follows:

- Teacher degree: Must have a bachelor's degree;
- Teacher training: Must have specialized training in preschool education;
- Assistant teacher qualification: Must have a Child Development Associate (CAD) or equivalent credential;
- Professional development: Teachers must receive at least 15 hours of annual in-service training;
- Class size: May not exceed 20 children;
- Ratio: May not exceed 10 children per staff member;
- Early learning standards: Comprehensive standards as specified by the National Education Goals Panel for physical well-being and motor development, social/emotional development, approaches toward learning, language development, and cognition and general knowledge;
- Comprehensive services: Vision, hearing, and health screenings and referrals as well as at least one service such as home visits, parent education, or nutrition information;
- Nutrition: Provision of at least one meal; and
- Monitoring quality: all sites are visited to assess program quality at least once every five years, (pp. 7-8).

NIEER's 2015 State of Preschool Yearbook (Barnett et al., 2016), identifies six states and a total of seven Pre-Kindergarten programs, which meet all 10 of the quality benchmark standards. According to NIEER (2016), the states which meet all 10 of the benchmark standards are Nebraska, Missouri, South Carolina, two preschool programs in Louisiana, and, for the first time, West Virginia and Mississippi meet all 10 benchmark standards.

Barnett and Carolan (2013) note the importance of careful interpretation of the NIEER program standards. According to Barnett (2016), NIEER emphasizes the program standards are not equal and scores should not be tallied and become the basis for comparing states to one another. For example, the nutrition standard is designed to prevent hunger so children are ready to learn, but if a quality teacher, not just a certified teacher, is not available, the gains may only be minimal (Barnett & Carolan, 2013). Friedman-Krauss (2017) note meeting the benchmarks does not ensure a high-quality program, pointing out a program may be very effective even though it does not meet every benchmark. However, Pre-Kindergarten children who make the largest gains in learning and development are from programs meeting or exceeding the benchmark standards, whereas children who show little to moderate gains attend programs that do not meet the benchmark standards (Barnett et al., 2016).

Characteristics of Quality Pre-Kindergarten Programs

According to Howes et al. (2008), the quality of a Pre-Kindergarten program affects the gains children experience. Higher-quality Pre-Kindergarten programs result in larger gains for children immediately after program completion and also results in sustained significant gains years after the children leave the program (Yoshikawa et al.,

2013). Programs of greater intensity and higher quality produce higher effects and for longer periods of time (Burchnial, Vanderfrift, Pianta, & Mashburn, 2010).

Yoshikawa et al. (2013) states, "Process quality features—children's immediate experience of positive and stimulating interactions—are the most important contributors to children's gains in language, literacy, mathematics, and social skills" (p. 6). The process structures researchers identify as most important to children's gains center around two distinct teacher-child interaction areas (Justice, Mashburn, Pence, & Wiggins, 2008; Wasik, Bond, & Hindman, 2006). The first focuses on interactions that specifically target teaching and learning of early language and math skills through an emphasis on higher-order thinking skills approach. The second focuses on a warm, nurturing environment where there is an exchange of conversations between the teacher and child, including discussions and elaborations on topics of learning. Evidence suggests children who have extended opportunities to engage in activities involving age-appropriate manipulatives have larger gains during Pre-Kindergarten and these gains are sustained in the early school years (Dickinson & Porche, 2011; Sylva, Melhuish, Sammons, Siraj-Blatchford, & Taggart, 2012; Vandell, Belsky, Burchinal, Steinberg, & Vandergrift, 2010).

Structural features include aspects of the program such as lower student-teacher ratios, higher teacher qualifications, smaller group sizes, and whether the program has a curriculum and classroom resources (Mead, 2012). Dickinson and Porche (2011) note while structural features are important, they do not ensure a quality Pre-Kindergarten program, rather they provide the setting necessary for children to experience more positive and stimulating interactions. Although teacher qualification factors, such as

higher education and certification in early childhood, have shown strong positive effects on children's gains, qualifications alone do not ensure a quality Pre-Kindergarten program capable of producing greater gains for children (Burchnial et al., 2010; Zaslow et al., 2010).

The curriculum taught in Pre-Kindergarten programs affects the quality of the program (Fantuzzo et al., 2011). Children taught a curriculum with a focus on language, literacy, and mathematics show significant gains in these areas (Lonigan, Farver, Phillips, & Clancey-Menchetti, 2011). In order to implement curriculum to achieve the greatest gains and address the needs of all children, professional development for teachers is an integral component of the curriculum and teaching and learning (Advisory Committee on Head Start Research and Evaluation, 2012; Lonigan et al., 2011). Professional development for preschool teachers, with a focus on both developmentally appropriate techniques for promoting literacy and ongoing instructional coaching, creates enriched learning opportunities for all children (Bierman et al., 2014; Bierman et al., 2008). According to Landry, Swank, Anthony, and Assel (2011), children who are engaged in learning environments created by appropriate curriculum and supported through structured and focused professional development show short-term improvements in both academic and social emotional learning, while sustaining these improvements into elementary school.

Current research, as well as research from the landmark Kindergarten programs, shows when Pre-Kindergarten programs are viewed as one group, they are found to be in the middle range in terms of quality programs (Yoshikawa et al., 2013). According to Farran and Lipsey (2016), for every number of Pre-Kindergarten programs providing

excellent quality, there are approximately the same number of programs of poor quality. The Classroom Assessment Scoring System is a tool used to evaluate preschool programs across the nation to determine the quality of the programs (University of Virginia, Curry School of Education, n.d.). The Classroom Assessment Scoring System is the tool Moiduddin et al. (2012) selected to evaluate 692 Pre-Kindergarten classrooms in 11 states with the goal of determining the quality of the programs. The results of the study are:

1. Pre-Kindergarten classrooms had a positive emotional climate with a consistency of 31.4%, but only mediocre instruction.
2. Mediocre, emotional climate and poor, instructional support were found in 18.5% of the classrooms.
3. There was a finding of 18.8% of classrooms rated as poor overall.
4. Head Start Programs were found to rate below average, although none were rated as poor.

Most of the Pre-Kindergarten programs evaluated by the Classroom Assessment Scoring System resulted in only a few months of added learning (Moiduddin et al., 2012). In a striking contrast, quality Pre-Kindergarten programs resulted in a half-year to a full-year of added learning (Lipsey, Hofer, Dong, Farran, & Bilbrey, 2013; Weiland, Ulvestad, Sachs, & Yoshikawa, 2013; Weiland & Yoshikawa, 2013).

Funding for Pre-Kindergarten Programs

State funding for Pre-Kindergarten programs is only one fiscal support for early childhood education. Preschool special education programs are funded with federal, state, and local dollars and serve children with special needs (United States Department of

Education, Office of Elementary and Secondary Education, 2012; United States Department of Education, Office of Special Education and Rehabilitative Services, 2014). Pre-Kindergarten programs, funded with and without state or federal support, are found in local school districts and communities (Barnett & Carolan, 2013). The public sector supported child care programs provide early childhood education programs through the Child Care Subsidies (United States Deartment of Health and Human Services, Administration for Children and Families, Office of Child Care, 2016) and tax credits to parents (IRS.gov, 2017). Additionally, parents pay for a variety of preschool and child care programs without additional funding from local, state, or federal sources (Barnett & Carolan, 2013).

Benefits of Pre-Kindergarten Programs

According to Camilli et al. (2010), preschool programs have a significant impact on early learning and development, including: language, literacy, math skills, social and emotional outcomes, and health. One or two years of Pre-Kindergarten, provided in developmentally appropriate programs, improves children's early literacy, language, and mathematics skills when the academic skills are measured at the conclusion of the Pre-Kindergarten program (Wong, Cook, Barnett, & Jung, 2008).

A report of 84 large-scale preschool programs shows children gain approximately one-third of a school year in language, reading, and math skills (Yoshikawa et al., 2013), The researchers also note two, at-scale programs show children who receive preschool programs gain between one-half and a full school year of additional learning in reading and math. Additionally, there are benefits associated with children's health and

socio-emotional development when programs focus on these aspects of child development (Center for Public Education, 2012).

Children from low-income homes receive more benefits from Pre-Kindergarten programs than do children from middle-income homes (Weiland & Yoshikawa, 2013). One can categorize executive functions into inhibitory control, working memory, and shift setting (Shah et al., 2017). Inhibitory control refers to a set of skills which allow children to choose one response over another, such as selecting to stay on the assigned task (Diamond, 2013). Working memory centers on retaining information and using it in different ways for problem solving (Welsh, Nix, Blair, Bierman, & Nelson, 2010). Shift setting involves disregarding one strategy for a new problem-solving strategy (Blair, 2016). Children from low-income homes are at risk of no development or poor development of the executive function skills due to the impacts of physical and environmental risks of poverty, which results in a negative impact on brain development (Shonkoff et al., 2000). Other research shows how children from poverty experience increased levels of the stress hormone cortisol, which impairs development of executive function skills (Blair et al., 2011). A second year of preschool provides opportunities for children to develop executive function skills as they develop higher executive function skills during first and second grade than children who attend preschool for one year or less (Shah et al., 2017).

Research by Barnett et al. (2005) found children from low-income families who attended state-funded Pre-Kindergarten programs gained skills in early language, literacy, and mathematics, which were significantly different from the children's program entry scores. Measurements of vocabulary revealed that children gained an additional four

months of growth due to the Pre-Kindergarten program (Barnett, 2010). Additionally, Barnett noted children who received Pre-Kindergarten services experienced 44% more growth in one year and a 13% increase, on average, in math scores than children who did not receive Pre-Kindergarten services. A second year of preschool was found to provide additional benefits to children from low-income homes into elementary school (Domitrovich et al., 2013). According to Shah et al. (2017), children who attended two years of preschool when compared to children who attended one year of preschool exhibited higher scores on vocabulary and math during first and second grades, had higher scores on reading at the completion of second grade, and developed higher executive function skills during first and second grade.

Further, the Center for Public Education (2012) attests to the family income level affecting the impact of Pre-Kindergarten gains. According to Cascio and Schanzenback (2013), Pre-Kindergarten services provided to children from lower-income level homes resulted in a positive impact on reading and math scores in 4th-grade. However, by eighth grade, the effect on reading diminished substantially, while the impact remained sizable for math. When the effect of Pre-Kindergarten services was studied for children from higher income homes, it was found reading and math scores did not improve in either fourth or eighth grade (Cascio & Schanzenback, 2013).

Nores and Barnett (2014) report equity of access to quality preschool programs does not exist. While public policy at the state and federal levels strives to provide quality preschool programs to disadvantaged children, they have been ineffective in bridging the quality of preschool services children receive (Cascio, 2017). Children who are African

American, Hispanic, and/or English Language Learners do not have the same opportunity for quality preschool education services as do other children (Nores & Barnett, 2014).

Children with special needs benefit from Pre-Kindergarten according to Yoshikawa et al. (2013), who found children with mild to moderate special needs show the same level of academic gains in reading and pre-writing skills as do children who were not identified as special needs children. Unfortunately, special needs children did not have significant gains in math skills. As reported by the Head Start Impact Study, at the completion of first grade, special needs children who attended Head Start as three-year-olds had greater gains in mathematics skills and social-emotional development than children who did not attend Head Start (United States Department of Health & Human Services, Administration for Children & Families, 2010).

Children designated as English Language Learners or Dual Language Learners who attend Head Start or public preschool programs benefit as much from these programs as do children who are native English speakers (Yoshikawa et al., 2013). Additional studies note national, non-experimental evidence for English Language Learners or Dual Language Learners shows these groups of children have gains in reading and mathematics, which are as significant as those for American born children (Magnuson, Lahaie, & Waldfogel, 2006), The National Head Start Impact Study finds positive gains on language development for non-English speaking children (United States Department of Health & Human Services, Administration for Children & Families, 2010). Gormley (2008) reports a state Pre-Kindergarten program finding higher gains for Hispanic children from homes where Spanish is most frequently spoken at home than for Hispanic children where English is the primary language spoken at home.

Researchers who followed children from preschool and Pre-Kindergarten programs through Grade 12 found as children progressed through schooling, the differences in reading and mathematics test achievement scores between those who received preschool and Pre-Kindergarten programs and those who did not diminished until there was a "fadeout" of all differences in gains (Leak et al., 2010). Farran and Lipsey (2016) followed children who participated in Pre-Kindergarten programs through 3rd-grade. They found children who attended Pre-Kindergarten programs made positive gains at the end of the program when compared to children who did not attend the Pre-Kindergarten program. They also reported by the end of Kindergarten, there was no difference in the achievement scores between children who attended Pre-Kindergarten and those who did not. Duncan and Magnuson (2013) reported when children were in second grade, the benefits of participating in preschool and Pre-Kindergarten were non-existent. Farran and Lipsey (2016) reported by the end of 3rd-grade, children who did not attend Pre-Kindergarten scored higher on some achievement measurers than did the children who attended Pre-Kindergarten. Also, the children who did not participate in the Pre-Kindergarten program actually caught up with, and in some areas scored higher than the Pre-Kindergarten participants (Ladd, Muschkin, & Dodge, 2014).

The Head Start Impact Study reported similar findings to those of Farran and Lipsey (2016). According to Puma et al. (2012), children who entered Head Start showed small gains on reading, pre-writing, and vocabulary at the end of Head Start and Kindergarten. The researchers also noted the self-reporting of children's reading skills by their parents revealed very little gains. Almost all of the gains found at the end of Head Start and Kindergarten disappeared by the end of first grade (Whitehurst, 2013a). Puma

et al. (2012) reported Head Start showed no effects on the longitudinal academic and social-emotional outcomes of children. According to Shah et al. (2017), there were inherent conditions of the Head Start Impact Study which resulted in unintended consequences on Head Start such as children in the control group were allowed to enroll in public and private Pre-Kindergarten programs and were allowed to receive instruction in their home and from other caregivers.

According to Zhai, Raver, and Jones (2012), there is not a strong evidence base to explain why both preschool attendees' and non-attendees' test scores converge after early childhood. In their study, Magnuson, Ruhm, and Waldfogel (2007) identify two explanations as to why the test scores converge. The researchers cite early grade schooling as lacking the quality necessary to build upon the foundational gains preschool or Pre-Kindergarten children have upon entering school. They also note teachers may spend more time with children who did not attend preschool or Pre-Kindergarten in order to try to improve the achievement levels of the non-attendees. Hill, Gormley, and Adelstein (2012) report when children who attended state-funded Pre-Kindergarten programs are followed through 3rd-grade, boys' reading scores looked similar to boys' scores who did not attend Pre-Kindergarten. Accordingly, gains in mathematics are found for boys who attended Pre-Kindergarten when compared to boys who did not attend Pre-Kindergarten. Lipsey et al. (2013) found while in first grade, children's cognitive skills converge, but the behavioral impacts were mixed.

Although the academic achievement gains of children who attend preschool and Pre-Kindergarten converge as children move through the early years of schooling, Yoshikawa et al. (2013) point out there are other significant benefits to the preschool and

Pre-Kindergarten children, and to society as a whole. According to researchers, (Campbell et al., 2008; Nores et al., 2005; Reynolds et al., 2011; Schweinhart et al., 2005), in adulthood, Pre-Kindergarten participation has long-term positive effects in comparison to non-Pre-Kindergarten participants. They identify the following long-term effects as:

- Pre-Kindergarten participants are less likely to have been arrested for violent crimes than are non-participants.
- Pre-Kindergarten participants are more likely to be employed than non-participants.
- In comparison to adults who did not attend Pre-Kindergarten, adults who did are more likely to earn higher wages.

They also found individuals who participate in preschool and Pre-Kindergarten programs are less likely to become teenage parents and are less likely to be involved in criminal activity (Yoskikawa et al., 2013).

Financial Implications of Pre-Kindergarten Programs

While implementation of Pre-Kindergarten programs comes with a cost, research indicates early childhood education programs and Pre-Kindergarten are a wise financial investment (Center for Public Education, 2012). Researchers use a cost-benefit framework to determine the value of the Pre-Kindergarten investment (Weimer & Vining, 2011). The cost-benefit framework is described as a method to systematically account for all costs and benefits associated with operating a program (Yoshikawa et al., 2013). According to Bartik et al. (2012), costs include all expenditures related to the Pre-Kindergarten program implementation and operation, such as staffing, operating

facilities, providing instructional materials, and transportation as well as generating other resource materials. The amount of benefit is derived from a comparison of the outcomes of children who participate in the program and those who do not (Reynolds et al., 2011). Benefits generally are grouped into two categories (Bartik et al., 2012). One category involves determining the dollar amount of reduced spending on program services for special education, grade-level retentions, remediation, criminal justice, welfare, and child protection (Yoshikawa et al., 2013). The researchers note the second category includes factors such as higher earnings, a positive economic improvement to the community, and a decrease in crime.

As indicated earlier, the landmark programs were well funded. Researchers analyzed the programs for cost per child. Benefit-cost analysis were conducted on the High/Scope Perry Preschool Programs, the Chicago Parent Child Programs, and the North Carolina Abecedarian Program.

Reynolds et al. (2011) determined the Chicago Child Parent Center Programs average cost per participant was $8,512 discounted at 3% and based on the value of the 2007 dollar. The researchers conducted a benefit-cost analysis and reported an estimated benefit of up to a 12 dollar rate of return for each dollar invested.

Heckman et al. (2010) calculated the cost of the High/Scope Perry Preschool at an undiscounted $17,759 per child and a benefit-cost of up to 10% based on the value of the dollar in 2006. Barnett and Masse (2007) reported the Perry Preschool Program benefit-cost was a return on investment of 9 dollars to every dollar spent.

The Abecedarian Project ran longer than the Perry Preschool and the Chicago Child Parent Center projects and was, therefore, costlier (Barnett & Masse, 2007).

Researchers Masse and Barnett (2010) applied a benefit-cost model to the Abecedarian Project. Barnett and Masse (2007) found there was up to a two and one-half dollar return on investment based on the value of the 2002-dollar. Masse and Barnett (2010) reported an overall rate of return between 3% and 7%.

According to the United States Department of Health and Human Services, Administration for Children and Families (n.d.), the average Head Start expenditure per child was $8,000 based on the value of the dollar in 2004. Ludwig and Phillips (2010) reported a complete benefit-cost analysis of Head Start had not been conducted. Sullivan (2016) noted that University of California at Berkeley researchers found every dollar invested in Head Start resulted in two dollars in future earnings for each child enrolled in the program.

It is more difficult for researchers to apply the benefit cost framework analysis to other state funded and universal Pre-Kindergarten programs due to the lack of longevity of the programs (Southern Education Foundation, 2011). The issue becomes more complex due to the mixed nature of preschool and Pre-Kindergarten services as well as the lack of nationwide data for expenditures and numbers of children served (Besharov, Myers & Morrow, 2007). Researchers develop benefit-cost projections by blending the results from the short-term projects with an evidenced based program relationship with the short-term and adult outcomes from those projects (Bartik et al., 2012). This method reveals Pre-Kindergarten programs with children from families of all income levels yield a benefit-cost from three-to-one up to five-to-one dollars for every dollar spent (Karoly & Bigelow, 2005; Southern Education Foundation, 2011). According to Yoshikawa et al. (2013), current evidence suggests the impact of every dollar spent on preschool and

Pre-Kindergarten for children's achievement and cognitive development has a larger rate of return than the funds spent on other well-known educational initiatives implemented once children enter school. These include reduced class size in elementary school (Southern Education Foundation, 2011). Additionally, research suggests expanding early learning provides a benefit-cost of $8.60 for every one dollar spent (White House Council of Economic Advisors, 2015).

The benefits of Pre-Kindergarten programs outweigh the costs for children from both low-income homes and middle-income homes (Yoshikawa et al., 2013). However, children from low-income homes benefit more dramatically than children from middle-income homes (Center for Public Education, 2012).

Federal Legislation Impacting Public School Pre-Kindergarten Programs

Across the nation, school districts continued to work on many fronts to ensure all children reach academic proficiency as required by NCLB (Center for Public Education, 2012). When President George W. Bush signed this into law, it was a landmark reform effort designed to improve the academic achievement of all children (NCLB, 2001). According to the United States Department of Education (2005), passage of the NCLB required high stakes accountability measures for public schools across the nation. The federal legislation required states receiving Title I, Part A dollars to implement statewide assessments for public schools in reading, mathematics, and science using the results for accountability purposes (NCLB, 2001). Assessment results were also required to be disaggregated by subgroups to ensure all students were making adequate academic progress (United States Department of Education, 2007). This significant change not only required disaggregation by subgroups, it also required states, school districts, and schools

to publicly report test score results for each subgroup (NCLB, 2001). NCLB subgroups were identified as follows: all students, students with Individual Education Plans (IEPs), limited English proficient students, economically disadvantaged students, Asian students, African American students, Hispanic students, Pacific Islander students, Caucasian students, and Other students (United States Department of Education, 2004).

According to the United States Department of Education (2005), one of the key tenants of NCLB is to support learning in the early years with the goal of preventing many of the learning difficulties, which often become evident as students progress through school. As schools and school districts continue to search for ways to address the early learning deficits of children, some are using Title I, Part A funds for Pre-Kindergarten programs (United States Department of Education, Office of Elementary Education, 2012). While Pre-Kindergarten programs are not required under NCLB, they are a Title I, Part A allowable expenditure (United States Department of Education, Office of Elementary and Secondary Education, 2015). According to the United States Department of Education (2005), NCLB targets resources for early childhood education to ensure all children begin their education at the appropriate level, thus preventing many of the reading problems adolescents and adults experience.

The ESSA, signed into law in 2015, reauthorized the Elementary and Secondary Education Act of 1965, as amended (ESSA, 2015). According to the United States Department of Education, Office of Elementary and Secondary Education (2015), ESSA replaced NCLB in the 2017-2018 school year. ESSA removed much of the federal government's large presence in public education policy as it shifted much of the implementation design requirements to states and their stakeholders (United States

Department of Education, Office of Elementary and Secondary Education, n.d.). ESSA maintained some of the NCLB requirements, primarily the requirement for student achievement of all subgroups in reading, mathematics, and science, as well as public reporting of the disaggregated data (ESSA, 2015). Additionally, the high stakes testing and accountability requirements of NCLB continued under ESSA (United States Department of Education, Office of Elementary and Secondary Education, n.d.).

The Elementary and Secondary Education Act of 1965, as amended, was a major contributor to the current discourse surrounding Pre-Kindergarten policy and funding (Center for Public Education, 2016; Zascavage, 2010). As local, state, and federal education budgets continue to shrink, policymakers at every level demand publicly funded programs have data to show the education systems are producing positive academic achievement results and are using taxpayer dollars effectively (Ferrarello, 2017).

Pre-Kindergarten in Mississippi

In 2012, Mississippi was one of 10 states in the nation without state-funded Pre-Kindergarten programs (Barnett & Carolan, 2013). Until recently, Mississippi was the only southern state without publicly funded Pre-Kindergarten (Mader, 2014). As reported by the United States Census Bureau (2016), Mississippi had the second highest poverty rate in the nation. According to the Child Welfare League of America (2017), 34.8% of children under five lived in poverty and 31.3% of children under 18 lived in poverty. According to Mader (2014), about half of the three and four-year-old children who lived in poverty were enrolled in some type of preschool, regardless of the funding source.

A growing number of public school districts in Mississippi leverage Title I, Part A funds for the purpose of providing Pre-Kindergarten programs within their districts (MDE, Office of Research and Development, 2016). In the 2009-2010 school year, 11% of Mississippi's four-year-old children were enrolled in public Pre-Kindergarten. Most of these students were regular education children enrolled in Title I, Part A Pre-Kindergarten programs (Canter, 2012). During the 2011-2012 school year, 51 of the 152 public school districts budgeted a combined $12.5 million in Title I, Part A funds to provide Pre-Kindergarten programs in public schools (Mississippi First, n.d.). The number of Title I, Part A Pre-Kindergarten programs in public school districts across the state ranged from one classroom to 10 classrooms. The average was five Pre-Kindergarten classrooms per public school district (Canter, 2012). Public school districts which fund Pre-Kindergarten programs with Title I, Part A funds do so at their choice, not as a federal or state requirement (United States Department of Education, Office of Elementary and Secondary Education, 2015).

Mississippi passed its first Pre-Kindergarten law, the Early Learning Collaborative Act, in spring of 2013, establishing the first, state-funded, voluntary Pre-Kindergarten program in Mississippi (Early Learning Collaborative Act, 2016). Implementation of the Early Learning Collaborative Act began in January 2014 with a budget of $3 million and a capacity to serve over 1,700 children (Guilfoyle, 2013). According to Mader (2014), MDE estimated 2,400 four-year-olds would receive state-funded Pre-Kindergarten services over three years, which amounted to fewer than 6% of the state's four-year-old population.

According to MDE (2016a), Mississippi completed its first full year of state-funded Pre-Kindergarten program implementation in the 2014-2015 school year. The state spent $3.1 million and enrolled 1,760 children (Guilfoyle, 2013). Barnett et al. (2016) identified Mississippi as one of only six states which met all 10 of NIEER's Pre-Kindergarten minimum quality standards and benchmarks in the 2014-2015 school year.

Mississippi's Literacy Based Promotion Act

In 2013, the Mississippi Legislature passed the Literacy Based Promotion Act, with implementation of the law beginning in the 2014-2015 school year (Literacy-Based Promotion Act, 2017a). The purpose of the law was to improve the reading skills of Kindergarten and first through 3rd-grade students enrolled in public schools, enabling them to exit 3rd-grade able to read at, or above, grade level (Ciurczak, 2016). According to MDE (2017), the Literacy-Based Promotion Act placed an emphasis on grade-level skills as students progress from Kindergarten through 3rd-grade. The Literacy-Based Promotion Act required a student scoring at the lowest level of achievement on the third-grade state assessment in reading to be retained in 3rd-grade (Literacy-Based Promotion Act, 2017a).

A student who fails the 3rd-grade state assessment in reading can be promoted to 4th-grade if he qualifies for a Good Cause Exemption (MDE, Office of Elementary Education and Reading, 2017). The Literacy-Based Promotion Act (2017b), establishes the following criteria as a Good Cause Exemption:

(a) Limited English Proficient students who have had less than two years of instruction in an English Language Learner program;

(b) Students with disabilities whose individual education plan (IEP) indicates that participation in the statewide accountability assessment program is not appropriate, as authorized under state law;

(c) Students with a disability who participate in the state annual accountability assessment and who have an IEP or a Section 504 plan that reflects the individual student has received intensive remediation in reading for more than two (2) years but still demonstrates a deficiency in reading or previously was retained in Kindergarten or First, Second or Third grade;

(d) Students who demonstrate an acceptable level of reading proficiency on an alternative standardized assessment approved by the State Board of Education; and

(e) Students who have received intensive intervention in reading for two (2) or more years but still demonstrate a deficiency in reading and who previously were retained in Kindergarten or First, Second or Third grade for a total of two (2) years and have not met exceptional education criteria (Literacy-Based Promotion Act, 2017b).

MDE mandated an additional, new assessment to monitor the implementation of the Literacy-Based Promotion Act, which began in the 2014-2015 school year (MDE, Office of Elementary Education and Reading, 2016). Prior to the Literacy-Based Promotion Act, a state assessment was not in place for student retention purposes in Kindergarten or first grade through eighth grade (Ciurczak, 2016). A student who did not score above the bottom quartile on the MDE-established 3rd-grade state assessment for reading was retained in 3rd-grade unless he qualified for a good cause exemption (MDE,

2017). All students enrolled in 3rd-grade in a public school in Mississippi at the time the assessment was administered were required to take the assessment (MDE, Office of Student Assessment, 2016).

MDE adopted the Renaissance STAR Literacy Assessment as the new assessment to comply with the Literacy-Based Promotion Act (MDE, Office of Elementary Education and Reading, 2016). After stakeholder input and review by MDE and MDE's National Technical Advisory Committee, MDE established a scale score of 926 as the minimum for passage on the 3rd Grade Reading Summative Assessment, which in the 2014-2015 and 2015-2016 school years was the Renaissance Learning STAR Early Literacy, known as the MKAS^2 (MDE, 2015). Accordingly, a scale score of 926 and above indicated 4th-grade readiness based upon the requirements set forth in the Literacy Based Promotion Act. Renaissance Learning indicated when a student earned a scale score above 900, he was out of the Probable Reader category and was able to read, spending less time trying to identify words, and more time understanding what was read (Renaissance Learning Inc., 2016).

MDE replaced the MKAS^2, Renaissance STAR Literacy Assessment, with the Mississippi Assessment Program English Language Arts Grade 3 Assessment to comply with the Literacy-Based Promotion Act. The change in assessments began with students who were 3rd-graders in the 2016-2017 school year (MDE, Office of Elementary Education and Reading, 2017). According to MDE, the Renaissance STAR Literacy Assessment became the alternative assessment (MDE, Office of Student Assessment, 2016).

Beginning with the 2018-2019 school year, the stakes will become higher for 3rd-graders. A 3rd-grade student must then score above the lowest two achievement levels on the 3rd Grade Reading Summative Assessment for promotion to 4th-grade (MDE, 2017).

Summary

This literature review was conducted to further the intellectual depth and understanding of previous research on Pre-Kindergarten programs, specifically the benefits and challenges faced by Pre-Kindergarten programs. Empirical research of landmark Pre-Kindergarten programs revealed the positive impacts on Pre-Kindergarten participants years after they completed the program, moved through the schooling process, and entered adulthood. As other Pre-Kindergarten programs were implemented, funding was not available to replicate the landmark programs. Additionally, the literature review was designed to provide a framework to understand the journey taken to develop Pre-Kindergarten Programs in Mississippi and the Literacy-Based Promotion Act.

CHAPTER III

DESIGN AND METHODOLOGY

Introduction

The purpose of this research study was to determine the impact of a Title I, Part A Pre-Kindergarten program on the later academic achievement of children in a rural, high poverty, high minority, public school district in Mississippi. The areas of later academic achievement addressed by the study were literacy and school attendance. MDE adopted assessments for compliance with the Literacy-Based Promotion Act were used as the 3rd-grade literacy assessment data. School attendance was measured by data entered into the school district's student level database by appropriate office staff at the elementary school. Assessment data and attendance data for the 2014-2015, 2015-2016, and 2016-2017 school years were used.

This chapter provides an overview of the research design, the research questions addressed, and a description of the participants. The procedures section identifies the data collection methods and procedures and is followed by the data analysis section, describing all analyses used in the study. A brief summary concludes the chapter.

Institutional Review Board and School Board Approval

Prior to data collection, permission was secured from the President of the Board of Trustees for the school district and the elementary school principal. Approval was also secured from the Mississippi State University Institutional Review Board for the

Protection of Human Subjects (Appendix A).

Research Design

This quantitative, causal-comparative study examined the 3rd-grade academic achievement of children to determine if a statistically significant difference existed between the students who received Pre-Kindergarten services in a rural, high poverty, high minority, public school district in Mississippi and those who did not receive such services. This research study used an ex post facto design whereby existing, archival data were collected from the records of students enrolled in the district's 3rd-grade during the 2014-2015, 2015-2016, and 2016-2017 school years.

To address the research question, the student scale scores on the MDE-approved 3rd Grade Reading Summative Assessment and school district student attendance data were used. The independent variables in the study were gender and participation in the school district's four-year-old, Title I, Part A Pre-Kindergarten program versus non-participation. The dependent variables were the Mississippi Assessment Program 3rd Grade Reading Summative Assessment scale scores and school attendance.

MDE used the MKAS^2 as the 3rd Grade Reading Summative Assessment in the 2014-2015 and 2015-2016 school years. In the 2016-2017 school year, the Mississippi Academic Assessment Program English Language Arts Assessment was used as the 3rd Grade Reading Summative Assessment. The scale scores on the two assessments were not the same. The MKAS^2 used a scale score range of 600 to 1200, while the English Language Arts Assessment scale score range was 301 to 399.

According to W. Drane (personal communication, October 3, 2017), Executive Director, Office of Student Assessment, MDE and Dr. K. Benton (personal

communication, October 4, 2017), Chief Academic Officer, MDE, percentiles were not established for MKAS^2. Rather, a pass/fail was the designated for 3rd grade students who took the MKAS^2. MDE (2015) reported 926 as the cut score to determine passage on the 3rd Grade Reading Summative Assessment.

The MKAS^2 scores for the 2014-2015 and 2015-2016 school year were analyzed as one data set. The Mississippi Academic Assessment Program English Language Arts Assessment was used as the 3rd Grade Reading Summative Assessment in the 2016-2017 school year. Those scores were analyzed independently from the MKAS^2 scores.

Attendance data were collected for the 2014-2015, 2015-2016, and 2016-2017 school years. All data were combined into one data set and analyzed collectively.

The quantitative, casual-comparative study analyzed archival data to determine if participation in the school district's Title I, Part A Pre-Kindergarten program had an effect on students' achievement at the end of 3rd-grade. According to Conrad and Serlin (2011), quantitative research methods are used to look at a phenomenon objectively and to determine the potential for replication, generalization of findings to other phenomenon of similar characteristics, and how the results can be used for predictions. The deductive methods allow researchers to make general inferences about characteristics of a population.

Martin and Bridgmon (2012) describe the casual-comparative, quantitative design as one whereby research attempts to establish a cause-effect relationship among the variables. In the casual-comparative design, the researcher identifies the independent variable, but does not manipulate it, rather the researcher measures the effects of the independent variable on the dependent variable (Creswell, 2014). Further, Creswell also

notes conclusions of analyses must be done carefully because other known or unknown variables could still affect the outcome.

A quantitative, casual-comparative design was the most appropriate design for this study, as it did not involve experimental research or manipulation of data. Furthermore, sampling was not employed in the study nor did the researcher seek to determine a correlation between the variables.

Setting

This study was conducted in a rural, high poverty, high minority, public school district in Mississippi. The Children's First Report cited the racial make up of the district as 75% African American, 20% Caucasian, and 5% other races, which were a combination of Asian, Hispanic, Native American, Multi-Racial, and Pacific Islanders (MDE, 2016c). The school district's Office of Child Nutrition reported 92% of students districtwide qualified for free and reduced price lunch. The school district had one elementary school, one middle school, and one secondary school. Approximately 670 students were enrolled in the elementary school, which comprised grades Pre-Kindergarten through sixth.

The 2016-2017 school year marked the sixth year the school district provided a Pre-Kindergarten program. The program was a full-day program and followed the school district's calendar of 180 days. The district provided transportation. The program began with two Pre-Kindergarten classrooms and added a third classroom in year three of the Pre-Kindergarten program, with a maximum enrollment of 20 students per classroom. An elementary teacher, licensed by the MDE, taught each class and was assisted by a full-time paraprofessional who met the MDE's highly qualified paraprofessional criteria.

The research study was conducted using the elementary school's archival data from the 3rd Grade Reading Summative Assessments adopted by the MDE for compliance with the Literacy-Based Promotion Act. Participants were selected by convenience sampling. Sampling was not used in the study. All students in the school who took the 3rd Grade Reading Summative Assessment were included in the study. Consent for participation was not obtained from parents of participants because secondary data from existing archived data sets were used to address the research question.

According to the United States Department of Education, Office of Elementary and Secondary Education (2012), schools and school districts may use Title I, Part A funds to provide Pre-Kindergarten services to children in schools and school districts receiving Title I, Part A funds. In the event all preschool-age children in the school or school district's attendance zone cannot be served, selection criteria must be established and used to ensure the children who are most at-risk of failing to meet the state's challenging academic standards are served (United States Department of Education, 2012). Furthermore, the school or school district must use multiple educationally-related facets, such as developmentally appropriate measures of child development, teacher judgment, and interviews with parents, to determine which children are most in need of services (United States Department of Education, 2015). Additionally, family income may be used as a one of the factors to determine the most academically at-risk children.

The Pre-Kindergarten program was federally funded with Title I, Part A dollars authorized by the Elementary and Secondary Education Act of 1965, as amended. The total number of available student slots accommodated every child who registered for the

Title I, Part A Pre-Kindergarten program. Therefore, some children who might not have otherwise met the pre-established, academically at-risk criteria received Pre-Kindergarten services.

Participants

The participants were the students enrolled in the school district's 3rd-grade in the 2014-2015, 2015-2016, and 2016-2017 school year. Participants were divided into two groups: Pre-Kindergarten participants and non-Pre-Kindergarten participants. A grouping variable was used to distinguish the groups. The non-Pre-Kindergarten grouping variable was 1 and the Pre-Kindergarten grouping variable was 2.

Group 1

The students who were enrolled in the school district as 3rd-graders in the 2014-2015, 2015-2016, and 2016-2017 school years, took the 3rd Grade Reading Summative Assessment, and did not attend the school district's four-year-old Title I, Part A Pre-Kindergarten program for a minimum of one-half the school year were assigned to Group 1. A total of 166 participants were assigned to Group 1.

Group 2

The students who were enrolled in the school district as 3rd-graders in the 2014-2015, 2015-2016, and 2016-2017 school years, took the 3rd Grade Reading Summative Assessment, and attended the school district's four-year-old Title I, Part A Pre-Kindergarten program for a minimum of one-half the school year were assigned to Group 2. A total of 105 participants were assigned to Group 2.

Research Questions

The primary research question addressed in this study was, "Does participation in a Title I, Part A Pre-Kindergarten have an impact on the later academic achievement of students in a rural, high poverty, high minority, public school district in Mississippi?"

The study was guided by the following research questions:

1. Are there significant differences between Pre-Kindergarten participants' and non-participants' achievement as measured by performance on the MDE 3rd Grade Reading Summative Assessment, given at the conclusion of 3rd-grade for the 2014-2015, 2015-2016, and 2016-2017 school years?
2. Are there significant differences between female Pre-Kindergarten participants' and non-participants' achievement as measured by performance on the MDE 3rd Grade Reading Summative Assessment, given at the conclusion of 3rd-grade for the 2014-2015, 2015-2016, and 2016-2017 school years?
3. Are there significant differences between male Pre-Kindergarten participants' and non-participants' achievement as measured by performance on the MDE 3rd Grade Reading Summative Assessment, given at the conclusion of 3rd-grade for the 2014-2015, 2015-2016, and 2016-2017 school years?
4. Are there significant differences between Pre-Kindergarten participants' and non-participants' school attendance rates as measured by cumulative attendance data at the conclusion of 3rd-grade for the 2014-2015, 2015-2016, and 2016-2017 school years?

Procedures

The Test Coordinator for the school district provided the researcher with archival assessment data. A report from the MDE 3rd Grade Reading Summative Assessment was provided for the 2014-2015, 2015-2016, and 2016-2017 school years.

The data processer at the district office provided the researcher with data from the school district's student database. The data provided were the gender and school attendance data of each 3rd-grade student enrolled in the 2014-2015, 2015-2016, and 2016-2017 school years. Pre-Kindergarten enrollment data for the school years 2010-2011, 2011-2012, and 2012-2013 were also provided. All data provided were de-identified, archival data.

A total of 271 participants were included in the study. The control group encompassed the students who did not receive the Pre-Kindergarten treatment. The treatment group was composed of the students who received the Pre-Kindergarten services.

Data Analysis

This quantitative study employed multiple data analysis procedures to determine if there was a statistically significant difference between the students who attended the Pre-Kindergarten program and the students who did not. According to Hurlburt (2012), a statistical difference infers the result is not likely to have occurred by chance. The effect is likely to be attributable to a specific cause. An alpha level of .05 was used to determine if the Pre-Kindergarten program had a statistically significant effect on literacy and school attendance in the 3rd-grade. This provided a 95% confidence level of significance.

The assumptions of normality, homogeneity of variance, and independence of observations were determined for the data set used to answer each research question. The Shapiro-Wilk Test for Normality was used to test the assumption of normality. Levene's Test of Homogeneity of Variance was used to test the assumption of homogeneity of variance. The assumption of Independence of Observations was met.

An Independent Samples *t*-Test was used to determine the mean score of the two separate groups and subsequently compare the mean scores to ascertain if there were a statistically significant difference between the means. The assumptions of normality, homogeneity of variance, and independence of observations were meet when an Independent Samples *t*-Test was used.

When data did not meet the assumption of normality, the researcher first attempted to transform the data to achieve normality. When data transformation did not achieve normality, the Independent Samples *t*-Test was not appropriate for statistical analysis. The Mann-Whitney U Test was used to analyze data that were not normally distributed. All data analyzed by the Mann-Whitney Test met the assumptions of dependent variable, independent variable, independence of observations, and distribution of scores.

Table 1 provides a summary of the statistical analysis procedure used for each variable and for each group.

Table 1

Statistical Instrument for Each Analysis

Variable	***Group***	***Statistical Test***
$MKAS^2$	All Students	Mann-Whitney U Test
$MKAS^2$	Female Students	Independent Samples *t*-Test
$MKAS^2$	Male Students	Mann-Whitney U Test
English Language Arts	All Students	Independent Samples *t*-Test
English Language Arts	Female Students	Independent Samples *t*-Test
English Language Arts	Male Students	Mann-Whitney U Test
Attendance	All Students	Independent Samples *t*-Test

The 3rd Grade Summative Assessment in school years 2014-2015 and 2015-2016 was the $MKAS^2$.The English Language Arts Assessment was used in the school year 2016-2017.

The Shapiro-Wilk Test for Normality ($p > .05$) showed the $MKAS^2$ data for the all student group were negatively skewed. Transformation of data did not achieve normality. The Mann-Whitney U Test was used to analyze the $MKAS^2$ data for the all student group to determine if there were a statistically significant difference between the scale scores of Pre-Kindergarten Participants and non-participants.

The $MKAS^2$ data for the female student group were analyzed by the Shapiro-Wilk Test for Normality ($p > .05$) and found to be normally distributed. Levene's Test of Equality of Variance ($p > .05$) found the assumption of homogeneity of variance was met. An Independent Samples *t*-Test was used for statistical analysis.

The MKAS^2 data for the male student group were analyzed by the Shapiro-Wilk Test for Normality ($p > .05$) and found to be negatively skewed. Transformation of data did not achieve normality. The Mann-Whitney U Test was used to analyze the MKAS^2 data for the male student group.

The Mississippi Academic Assessment Program English Language Arts Assessment data for all students were analyzed by the Shapiro-Wilk Test for Normality ($p > .05$) and found to be normally distributed. Levene's Test of Equality of Variance ($p > .05$) found the assumption of homogeneity of variance was met. An Independent Samples *t*-Test was used for statistical analysis.

The Shapiro-Wilk Test for Normality ($p > .05$) showed the Mississippi Academic Assessment Program English Language Arts Assessment data for the female student group was normally distributed. Levene's Test of Equality of Variance ($p > .05$) found the assumption of homogeneity of variance was met. The Independent Samples *t*-Test was used for data analysis.

The Mississippi Academic Assessment Program English Language Arts Assessment scale scores for the male student group were analyzed by the Shapiro-Wilk Test for Normality ($p > .05$) and found to have an outlier that prevented normal distribution of the data. Transformation of data achieved normality. Levene's Test of Equality of Variance ($p > .05$) found the assumption of homogeneity of variance was met. An Independent Samples *t*-Test was used for data analysis.

Attendance data were analyzed by the Shapiro-Wilk Test for Normality ($p > .05$) and found to be normally distributed. Levene's Test of Equality of Variance ($p > .05$) found the assumption of homogeneity of variance was met. An Independent Samples

t-Test was used to determine whether a statistically significant difference existed between the student attendance rates of Pre-Kindergarten participants versus non-participants.

The researcher used IBM Statistical Package for the Social Sciences to analyze the data sets for each question (IBM Corporation, 2013).

Summary

This chapter provided a review of the study's purpose. It provided specific details on participation selection, the research design, and details data analysis. Prior to data collection, written permission was secured from the school district Board of Trustees, the elementary school principal, and the Institutional Review Board for Mississippi State University. The goal of the study was to determine if there was a statistically significant difference in the later academic achievement of students who participated in the school district's Title I, Part A Pre-Kindergarten program in comparison to students who did not. An Independent Samples *t*-Test or a Mann-Whitney U Test was used to analyze the data necessary to answer each research question. The data analysis results are presented in the following chapter.

CHAPTER IV

RESULTS

Introduction

The purpose of the research study was to determine the impact of a Title I, Part A Pre-Kindergarten program on the later academic achievement of children in a rural, high poverty, high minority, public school district in Mississippi. This quantitative study examined the later academic achievement of students to determine if a statistically significant difference existed between the students who received Pre-Kindergarten services and those who did not. The study investigated whether the district's Title I, Part A program had a statistically significant effect on the later academic achievement of students who participated in the program when compared to students who did not attend the program. To determine the impact of a Title I, Part A Pre-Kindergarten program on the later academic achievement, student scale scores on the 3rd Grade Reading Summative Assessment and student attendance were measured by an Independent Samples *t*-Test or a Mann-Whitney U Test. The findings of the data analyses are presented in this chapter.

Participant Demographics

Participants were divided into two groups: Pre-Kindergarten participants and non-Pre-Kindergarten participants. A grouping variable was used to distinguish the

groups. The non-Pre-Kindergarten grouping variable was 1 and the Pre-Kindergarten grouping variable was 2.

Table 2 summarizes the demographic information of the participants who took the MKAS[2] as the 3rd Grade Reading Summative Assessment.

Table 2

MKAS2 Participant Demographic Information

	Pre-Kindergarten Participant *n = 72*		Non-Pre-Kindergarten Participant *n = 110*	
Variable	***F***	**%**	***F***	**%**
All Students	72	100	110	100
Gender				
Female	32	44.45	52	47.28
Male	40	55.56	58	52.73

The MKAS[2] was the 3rd Grade Summative Assessment in school years 2014-2015 and 2015-2016. school years. The English Language Arts Assessment was used in the school year 2016-2017.

Table 3 summarizes the demographic information of the participants who took the Mississippi Academic Assessment Program English Language Arts assessment as the 3rd Grade Reading Summative Assessment.

Table 3

Mississippi Academic Assessment Program English Language Arts Participant Demographic Information

	Pre-Kindergarten Participant *n = 33*		Non-Pre-Kindergarten Participant *n = 56*	
Variable	**F**	**%**	**F**	**%**
All Students	33	100	56	100
Gender				
Female	20	60.61	22	39.29
Male	13	39.39	34	60.71

The 3rd Grade Reading Summative Assessment in the 2016-2017 school year was the English Language Arts Assessment.

Research Question

The Independent Samples *t*-Test allowed the researcher to determine the mean score of two separate groups and subsequently to compare the mean scores to see if there was a statistically significant difference between the means. The non-parametric Mann-Whitney U Test allowed the researcher to determine if there were statistically significant differences between the two groups.

The treatment group was composed of the students who attended the district's four-year-old Pre-Kindergarten program for a minimum of one-half year. The control group was the participants who did not receive the Pre-Kindergarten treatment or received treatment for less than one-half a year.

The MDE used the MKAS^2 as the 3rd Grade Reading Summative Assessment in the 2014-2015 and 2015-2016 school years. In the 2016-2017 school year, the Mississippi Academic Assessment Program English Language Arts Assessment was used as the 3rd Grade Reading Summative Assessment. The scale score range on the two assessments were not the same. The MKAS^2 used a scale score range of 600 to 1200, while the English Language Arts Assessment scale score range was 301to 399.

The MKAS^2 scores for the 2014-2015 and 2015-2016 school year were analyzed as one data set. The Mississippi Academic Assessment Program English Language Arts Assessment was used as the 3rd Grade Reading Summative Assessment in the 2016-2017 school year. Those scores were analyzed independently from the MKAS^2 scores.

Attendance data were collected for the 2014-2015, 2015-2016, and 2016-2017 school years. All data were combined into one data set and analyzed collectively.

Research Question One

Question 1: Are there significant differences between Pre-Kindergarten participants' and non-participants' achievement as measured by performance on the MDE 3rd Grade Reading Summative Assessment given, at the conclusion of 3rd-grade for the 2014-2015, 2015-2016, and 2016-2017 school years?

The first research question examined the 3rd Grade Summative Reading Assessment scale scores for all students. A Mann-Whitney U Test was conducted to compare the 2014-2016 3rd grade summative MKAS^2 scale scores for students who participated in the school district's Title I, Part A Pre-Kindergarten Program and those who did not. An Independent Samples *t*-Test was conducted to compare the 2016-2017 3rd grade summative Mississippi Academic Assessment Program English Language Arts

scale scores for students who participated in the school district's Title I, Part A Pre-Kindergarten Program and those who did not.

MKAS^2 3rd Grade Reading Summative Assessment. Table 4 summarizes the results of the Mann-Whitney U Test for the MKAS^2 scale scores of the all student group.

Table 4

Mann-Whitney U Test Comparison of Pre-Kindergarten and Non-Pre-Kindergarten Participants' MKAS^2 Scale Scores

Scale Scores	***N***	**Mean Rank**	**Sum of Ranks**	**Sig (2-tailed)**
Pre-K	72	102.32	7367.00	.025
No Pre-K	110	84.42	9286.00	
Total	182			

Data are from the 2014-2015 and 2015-2016 3rd Grade Reading Summative Assessment.

A Mann-Whitney U Test was used to determine if there were differences in the MKAS^2 scale scores for students who participated in the school district's Title I, Part A Pre-Kindergarten Program and those who did not. A total of 182 students took the MKAS^2 3rd Grade Reading Summative Assessment during the 2014-2015 and 2015-2016 school years: 72 had received Pre-Kindergarten services and 110 had not. Distributions of the MKAS^2 scale scores for Pre-Kindergarten participants and non-participants were not similar, as assessed by visual inspection. MKAS^2 scale scores for Pre-Kindergarten participants (mean rank = 102.32) were statistically significantly higher than for non-participants (mean rank = 84.42), $U = 4{,}739.00$, $p = .025$. The results suggest

Pre-Kindergarten participation did have an effect on the reading scale scores of students who participated in the school district's Title I, Part A Pre-Kindergarten program. Specifically, the results suggest Pre-Kindergarten participants level of reading achievement in the 3rd-grade increased as a result of Pre-Kindergarten participation.

English Language Arts 3rd Grade Reading Summative Assessment. Table 5 summarizes the Independent Samples *t*-Test results for the Mississippi Academic Assessment Program English Language Arts scale scores for the all student group.

Table 5

Independent Samples t-Test Comparison of Pre-Kindergarten and Non-Pre-Kindergarten Participants' Mississippi Academic Assessment Program English Language Arts ScaleScores

Variable	***N***	**Mean**	**Stan Dev**	**Sig**
Pre-K	33	357.15	16.05	.053
Non-Pre-K	56	350.54	15.00	
Total	89			

Data are from the 2016-2017 3rd Grade Reading Summative Assessment.

An Independent Samples *t*-Test was conducted to compare the 2016-2017 3rd grade summative Mississippi Academic Assessment Program English Language Arts scale scores for students who participated in the school district's Title I, Part A Pre-Kindergarten Program and those who did not. Eighty-nine students took the 3rd Grade Reading Summative Assessment during the 2016-2017 school year: 33 had received Pre-Kindergarten services and 56 had not. There was not a significant difference in the main

effect between Pre-Kindergarten participants (M = 357.15, SD = 16.05) and non-Pre-Kindergarten participants (M = 350.54, SD = 15.00), t (87) = 1.96, p = .053. The results suggest Pre-Kindergarten participation did not have an effect on the reading scale scores of students who participated in the school district's Title I, Part A Pre-Kindergarten program. Specifically, the results suggest Pre-Kindergarten participants level of reading achievement in the 3rd-grade did not increase as a result of Pre-Kindergarten participation.

Research Question Two

Question 2: Are there significant differences between female Pre-Kindergarten participants' and non-participants' achievement as measured by performance on the MDE 3rd Grade Reading Summative Assessment given at the conclusion of 3rd-grade for the 2014-2015, 2015-2016, and 2016-2017 school years?

The second research question examined the MDE 3rd Grade Summative Reading Assessment scale scores for female students. An Independent Samples *t*-Test was conducted to compare the 2014-2016 3rd grade summative MKAS^2 scale scores for female students who participated in the school district's Title I, Part A Pre-Kindergarten Program and those who did not. An Independent Samples *t*-Test was conducted to compare the 2016-2017 3rd grade summative Mississippi Academic Assessment Program English Language Arts scale scores for female students who participated in the school district's Title I, Part A Pre-Kindergarten Program and those who did not.

MKAS^2 3rd Grade Reading Summative Assessment. Table 6 summarizes the Independent Samples *t*-Test results for the MKAS^2 scale scores of the female student group.

Table 6

Independent Samples t-Test Comparison of Female Pre-Kindergarten and Non-Pre-Kindergarten Participants' MKAS^2 Scale Scores

Variable	***N***	**Mean**	**Stan Dev**	**Sig**
Pre-K	32	1005.34	49.69	.002
Non-Pre-K	52	967.79	52.49	
Total	84			

Data are from the 2014-2015 and 2015-2016 3rd Grade Reading Summative Assessment

An Independent Samples *t*-Test was conducted to compare the MKAS^2 scale scores for female students who participated in the school district's Title I, Part A Pre-Kindergarten Program and those who did not. A total of 84 female students took the MKAS^2 3rd Grade Reading Summative Assessment during the 2014-2015 and 2015-2016 school years: 32 had received Pre-Kindergarten services and 52 had not. A statistically significant difference was found in the main effect between female Pre-Kindergarten participants (M = 1005.34, SD = 49.69), and non-Pre-Kindergarten participants (M = 967.79, SD = 52.49), t (82) = .3.25, p = .002. The results suggest Pre-Kindergarten participation did have an effect on the 3rd grade reading achievement of female students. Specifically, the results suggest female Pre-Kindergarten participants level of reading achievement in the 3rd-grade increased as a result of Pre-Kindergarten participation.

English Language Arts 3rd Grade Reading Summative Assessment. Table 7 summarizes the Independent Samples *t*-Test results for the Mississippi Academic Assessment Program English Language Arts scale scores for the female student group.

Table 7

Independent Samples t-Test Comparison of Female Pre-Kindergarten and Non-Pre-Kindergarten Participants' Mississippi Academic Assessment Program English Language Arts Scale Scores

Variable	***N***	**Mean**	**Stan Dev**	**Sig**
Pre-K	20	356.95	16.16	.942
Non-Pre-K	22	356.59	15.48	
Total	42			

Data are from the 2016-2017 3rd Grade Reading Summative Assessment.

An Independent Samples *t*-Test was conducted to compare the 2016-2017 3rd grade summative Mississippi Academic Assessment Program English Language Arts scale scores for female students who participated in the school district's Title I, Part A Pre-Kindergarten Program and those who did not. During the 2016-2017 school year there were 42 female students who took the 3rd Grade Reading Summative Assessment: 20 had received Pre-Kindergarten services and 22 had not. There was not a significant difference in the main effect between female Pre-Kindergarten participants (M = 356.95, SD = 16.16) and non-Pre-Kindergarten participants (M = 356.59, SD = 15.48), t (40) = .074, p = .942. The results suggest Pre-Kindergarten participation did not have an effect on the reading scale scores of female students who

participated in the school district's Title I, Part A Pre-Kindergarten program. Specifically, the results suggest female Pre-Kindergarten participants level of reading achievement in the 3rd-grade did not increase as a result of Pre-Kindergarten participation.

Research Question Three

Question 3: Are there significant differences between male Pre-Kindergarten participants' and non-participants' achievement as measured by performance on the MDE 3rd Grade Reading Summative Assessment given at the conclusion of 3rd-grade for the 2014-2015, 2015-2016, and 2016-2017 school years?

The third research question examined the MDE 3rd Grade Summative Reading Assessment scale scores for male Pre-Kindergarten participants' and non-participants'. A Mann-Whitney U Test was conducted to compare the 2014-2016 MKAS^2 scale scores for male students who participated in the school district's Title I, Part A Pre-Kindergarten Program and those who did not. An Independent Samples *t*-Test was conducted to compare the 2016-2017 Mississippi Academic Assessment Program English Language Arts scale scores for students who participated in the school district's Title I, Part A Pre-Kindergarten Program and those who did not.

MKAS^2 3rd Grade Reading Summative Assessment. Table 8 summarizes the Mann-Whitney U Test results for the MKAS^2 scale scores for the male student group.

Table 8

Mann-Whitney U Test Comparison of Male Pre-Kindergarten and Non-Pre-Kindergarten Participants' MKAS^2 Scale Scores

Scale Scores	***N***	**Mean Rank**	**Sum of Ranks**	**Sig (2-tailed)**
Pre-K	40	52.58	2103.00	.374
No Pre-K	58	47.38	2748.00	
Total	98			

Data are from the 2014-2015 and 2015-2016 3rd Grade Reading Summative Assessment

A Mann-Whitney U Test was executed to determine if there were differences in the MKAS^2 scale scores for male students who participated in the school district's Title I, Part A Pre-Kindergarten Program and those who did not. A total of 98 students took the MKAS^2 3rd Grade Reading Summative Assessment during the 2014-2015 and 2015-2016 school years: 40 had received Pre-Kindergarten services and 58 had not. Distributions of the MKAS^2 scale scores for Pre-Kindergarten participants and non-participants were not similar, as assessed by visual inspection. MKAS^2 scale scores for male Pre-Kindergarten participants (mean rank = 52.58) were not statistically significantly higher than for non-participants (mean rank = 47.38), $U = 1037.00$, $p = .374$. The results suggest Pre-Kindergarten participation did not have an effect on the reading scale scores of male students who participated in the school district's Title I, Part A Pre-Kindergarten program. Specifically, the results suggest male Pre-Kindergarten participants level of reading achievement in the 3rd-grade did not increase as a result of Pre-Kindergarten participation.

English Language Arts 3rd Grade Reading Summative Assessment.

Table 9 summarizes the Independent Samples *t*-Test results for the Mississippi Academic Assessment Program English Language Arts scale scores for the male student group.

Table 9

Independent Samples t-Test Comparison of Male Pre-Kindergarten and Non-Pre-Kindergarten Participants' Mississippi Academic Assessment Program English Language Arts Scale Scores

Variable	***N***	**Mean**	**Stan Dev**	**Sig**
Pre-K	13	2.55	.02	.028
Non-Pre-K	34	2.54	.017	
Total	47			

Data are from the 2016-2017 3rd Grade Reading Summative Assessment.

An Independent Samples *t*-Test was conducted to compare the Mississippi Academic Assessment Program English Language Arts scale scores for male students who participated in the school district's Title I, Part A Pre-Kindergarten Program and those who did not. A total of 47 male students took the 3rd Grade Reading Summative Assessment in the 2016-2017 school year. There was a statistically significant difference in the main effect between male Pre-Kindergarten participants ($M = 2.55$, $SD = .02$) and non-Pre-Kindergarten participants ($M = 2.54$, $SD = .017$), $t\ (45) = 2.28$, $p = .028$. The results suggest Pre-Kindergarten participation did have an effect on the reading scale scores of male students who participated in the school district's Title I, Part A

Pre-Kindergarten program. However, it is important to note the sample size. The Pre-Kindergarten sample is quite small with only 13 participants, while the non-participant group is slightly larger, it is less than twice the size of the Pre-Kindergarten group with 34 participants.

Research Question Four

Question 4: Are there significant differences between Pre-Kindergarten participants' and non-participants' school attendance rates as measured by cumulative attendance data at the conclusion of 3rd-grade for the 2014-2015, 2015-2016, and 2016-2017 school years?

Table 10 summarizes the Independent Samples *t*-Test results for the attendance rates of Pre-Kindergarten and non-Pre-Kindergarten participants for the 2014-2015, 2015-2016, and 2016-2017 school years.

Table 10

Comparison of School Attendance Rates of Pre-Kindergarten Participants and Non-Pre-Kindergarten Participants

Variable	***N***	**Mean**	**Stan Dev**	**Sig**
Pre-K	105	5.25	4.11	.006
Non-Pre-K	166	7.08	6.72	
Total	271			

Data are from the 2014-2015, 2015-2016, and 2016-2017 school year corresponding to the 3rd Grade Reading Summative Assessment.

An Independent Samples *t*-Test was conducted to compare school attendance rates for students who participated in the school district's Title I, Part A Pre-Kindergarten Program and those who did not. A total of 271 students were took a 3rd Grade Reading Summative Assessment during the 2014-2015, 2015-2016, and 2016-2017 school years. There was a significant difference in the main effect of attendance for Pre-Kindergarten participants ($M = 5.25$, $SD = 4.11$) and non-Pre-Kindergarten participants ($M = 7.08$, $SD = 6.72$), $t\ (269) = 2.52$, $p = .006$. The results suggest Pre-Kindergarten participation did have an effect on the attendance rates of students. Specifically, these results suggest when children attend a Pre-Kindergarten program they miss fewer days of school in grade three than children who did not attend th school district's Title I, Part A Pre-Kindergarten program.

Discussion

Analysis of data for Research Question 1 yielded a statistically significant difference between the Pre-Kindergarten participants compared to the non-participants on the MKAS^2 3rd Grade Reading Summative Assessment. Analysis of Mississippi Academic Assessment English Language Arts as the 3rd Grade Reading Summative Assessment did not find a statistically significant difference between the scores of Pre-Kindergarten participants and non-participants. Analysis of MKAS^2 resulted in a median of 985.5 for the students who participated in Pre-Kindergarten and a median of 974.00 for the students who did not participate in Pre-Kindergarten. The findings suggest Pre-Kindergarten participants level of reading as measured by the MKAS2 in the 3rd-grade increased as a result of Pre-Kindergarten participation.

Analysis of the Mississippi Academic Assessment Program English Language Arts Assessment for Research Question 1 were not statistically significant; however, there was a difference in the mean scores of the all student group. Students who participated in Pre-Kindergarten had a mean score of 357.15 while non-participants had a mean score of 350.54. The Pre-Kindergarten participants received a mean score 6.61 points higher than the non-participants.

Research Question 2 yielded statistically significant differences between female Pre-Kindergarten participants and non-participants on the MKAS^2 3rd Grade Reading Summative Assessment, but not on the Mississippi Academic Assessment Program English Language Arts Assessment 3rd Grade Reading Summative Assessment. Female students who participated in Pre-Kindergarten had a mean score of 1005.34 on the MKAS^2 3rd Grade Reading Summative Assessment and non-participants had a mean score of 967.79, which resulted in a difference of 37.55 scale score points. The Pre-Kindergarten participant and non-participant scale scores on the Mississippi Academic Assessment Program English Language Arts Assessment 3rd Grade Reading Summative Assessment differed by less than one hundredth of a point. The results suggest that while Pre-Kindergarten participation did result in increased reading achievement on the MKAS2, it did not result in an increased reading on the Mississippi Academic Assessment Program English Language Arts 3rd Grade Reading Summative Assessment.

The results for Research Question 3 did not find a statistically significantly difference between male Pre-Kindergarten participants' and non-participants' MKAS^2 scale scores. Analysis of male students' MKAS^2 reported a median of 981.50 for the

students who participated in Pre-Kindergarten and a median of 975.00 for the students who did not participate in Pre-Kindergarten, a difference of 6.50 scale score points. The results suggest that Pre-Kindergarten participation did not result in increased levels of reading achievement on the 3rd Grade Reading Summative Assessment. The Pre-Kindergarten participant and non-participant scale scores on the Mississippi Academic Assessment Program English Language Arts Assessment 3rd Grade Reading Summative Assessment showed there was a statistical difference between Pre-Kindergarten participants and non-participants scale scores. It should be noted the sample size for male Pre-Kindergarten participants was quite small (n = 13).

Analysis of Research Question 4 showed a statistically significant difference between Pre-Kindergarten participants' and non-participants' school attendance rates when measured at the end of 3rd-grade. Pre-Kindergarten participants had a mean score of 5.25 in comparison to a score of 7.08 for non-participants. The findings suggest that participation in Pre-Kindergarten results in higher attendance rates in later school years.

Summary

This chapter provided the results of the Independent Samples t-Test and Mann-Whitney Test used to analyze the research questions. The 2014-2015 school years MKAS2 3rd Grade Reading Summative Assessment noted statistically significant differences in the main effect between Pre-Kindergarten participants and non-participants in the all student group and the female group, but not in the male group. The 2016-2017 school year English Language Arts 3rd Grade Summative Assessment reported statistically significant differences in the main effect between Pre-Kindergarten participants and non-participants in the male group, but not in the all student group nor

the female group. The Independent Samples *t*-Test yielded statistically significant differences between the Pre-Kindergarten participants and the non-participants in the main effect for attendance.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

According to The Pew Center on the States (2011), the benefits of Pre-Kindergarten attendance transcend racial groups and income levels. Although benefits are well documented, there is still considerable discourse as to whether the benefits fade out or remain as children progress through school (Barnett, Lamy, & Jung, 2005). Additionally, the Center for Public Education (2012) described the landmark preschool and Pre-Kindergarten programs as well funded and well staffed. Further, Pre-Kindergarten programs since that time have continued to be studied, with the results having implications for policy and financial decisions.

President Lyndon B. Johnson launched the War on Poverty in his 1964 Annual Message to the Congress on the State of the Union (Johnson, 1964). The War on Poverty yielded two program initiatives which continue to have a direct impact on education: the Elementary and Secondary Education Act, which established the Title I, Part A program for the purpose of providing supplemental funds to school districts with high percentages of improvised students; and the Economic Opportunity Act of 1964, which created Head Start (Matthews, 2014). Funding Pre-Kindergarten programs is an allowable expenditure under Title I, Part A (United States Department of Education, 2012).

Understanding the purposes and benefits of Pre-Kindergarten has changed considerably over the past decade. Once viewed as a childcare support for working parents, research has shown quality Pre-Kindergarten to be a valuable educational opportunity and a critical part of, "Sustainable, long-term economic development," (The Pew Center on the States, 2011).

Summary

The goal of this study was to determine if a Pre-Kindergarten program implemented in a rural, high poverty, high minority school district in Mississippi had an impact on the later academic achievement of students. Although the school district had implemented and maintained a Pre-Kindergarten program for six years, no empirical research had been conducted to determine if the program was making a significant difference in the academic achievement levels of the students. This study is the first formal assessment of the school district's Pre-Kindergarten program.

The district made a substantial financial investment in the Pre-Kindergarten program by providing a MDE licensed teacher and a highly qualified teacher assistant in each classroom. The financial investment included transportation costs as the school district ran a separate bus route exclusively for the Pre-Kindergarten children. Additionally, costs were incurred for classroom materials and supplies, and for special program activities such as field trips.

The primary research question addressed in this study was, "Does participation in a Title I, Part A Pre-Kindergarten have an impact on the later academic achievement of students in a rural, high poverty, high minority, public school district in Mississippi?"

The study was guided by the following research questions:

1. Are there significant differences between Pre-Kindergarten participants' and non-participants' achievement as measured by performance on the MDE 3rd Grade Reading Summative Assessment, given at the conclusion of 3rd-grade for the 2014-2015, 2015-2016, and 2016-2017 school years?
2. Are there significant differences between female Pre-Kindergarten participants' and non-participants' achievement as measured by performance on the MDE 3rd Grade Reading Summative Assessment, given at the conclusion of 3rd-grade for the 2014-2015, 2015-2016, and 2016-2017 school years?
3. Are there significant differences between male Pre-Kindergarten participants' and non-participants' achievement as measured by performance on the MDE 3rd Grade Reading Summative Assessment, given at the conclusion of 3rd-grade for the 2014-2015, 2015-2016, and 2016-2017 school years?
4. Are there significant differences between Pre-Kindergarten participants' and non-participants' school attendance rates as measured by cumulative attendance data at the conclusion of 3rd-grade for the 2014-2015, 2015-2016, and 2016-2017 school years?

Table 11 summarizes all statistical analyses and provides the corresponding statistical significance.

Table 11

Statistical Analyses Summary

Variable	Test	Sig Level Results
MKAS[2]		
All students	Mann-Whitney U Test	.025
Female students	Independent Samples *t*-Test	.002
Male students	Mann-Whitney U Test	.374
Mississippi Academic Assessment English Language Arts		
All students	Independent Samples *t*-Test	.053
Female students	Independent Samples *t*-Test	.942
Male students	Independent Samples *t*-Test	.028
Attendance	Independent Samples *t*-Test	.006

Includes all data analyzed, statistical tests employed and the corresponding results.

Research Question 1 yielded mixed findings. Analysis of MKAS[2] assessment data for the all student group yielded significant differences between Pre-Kindergarten participants' and non-participants' scale scores. However, significant results were not found for the all student group when the Mississippi Academic Assessment English Language Arts was analyzed. It should be noted there were differences in sample sizes between the two assessments. A total of 182 students took the MKAS[2] assessment during the 2014-2015 and 2015-2016 school years, while 89 students took the English Language Arts assessment in the 2016-2017 school year. The statistically significant findings on the MKAS[2] suggest there was a relationship between Pre-Kindergarten participation and the

later academic achievement of students when measured by the 3rd Grade Reading Summative Assessment. The non-significant findings on the Mississippi Academic Assessment English Language Arts suggest there was not a relationship between Pre-Kindergarten participants' and non-participant' achievement on the 3rd Grade Reading Summative Assessment.

Mixed results were found for Research Question 2. Analysis of MKAS^2 assessment data for the female student group reported significant differences between female Pre-Kindergarten participants' and non-participants' scale scores. However, significant results were not found for the female student group when the Mississippi Academic Assessment English Language Arts was analyzed. It should be noted there were differences in sample sizes between the two assessments. A total of 84 female students took the MKAS^2 assessment during the 2014-2015 and 2015-2016 school years, while 42 took the English Language Arts assessment in the 2016-2017 school year. The statistically significant findings on the MKAS^2 suggest there was a relationship between Pre-Kindergarten participation and the later academic achievement of female students when measured by the 3rd Grade Reading Summative Assessment. The non-significant findings on the Mississippi Academic Assessment English Language Arts suggest there was not a relationship between Pre-Kindergarten participants' and non-participant' achievement on the 3rd Grade Reading Summative Assessment.

Analysis of Research Question 3 reported mixed findings. Significant differences were not found between male Pre-Kindergarten participants' and non-participants' MKAS^2 scale scores. However, significant results were found for the male student group when the Mississippi Academic Assessment English Language Arts was analyzed. It

should be noted there were differences in sample sizes between the two assessments. A total of 98 students took the MKAS^2 assessment during the 2014-2015 and 2015-2016 school years. The sample size for the Mississippi Academic Assessment Program English Language Arts was quite small. A total of 47 male students took the assessment, 13 Pre-Kindergarten participants and 34 non-participants. The non-statistically significant findings on the MKAS^2 suggest there was not a relationship between male Pre-Kindergarten participation and the later academic achievement of students when measured by the 3rd Grade Reading Summative Assessment. The significant findings on the Mississippi Academic Assessment English Language Arts suggest there was a relationship between Pre-Kindergarten participants' and non-participant' later academic achievement when measured by the 3rd Grade Reading Summative Assessment.

Research Question 4 yielded a significant difference between school attendance rates of students who participated in the school district's Title I, Part A Pre-Kindergarten Program and those who did not. Attendance rates were analyzed for the students who took a 3rd Grade Reading Summative Assessment during the 2014-2015, 2015-2016, and 2016-2017 school years. A total of 271 students comprised the sample: 105 were Pre-Kindergarten participants while 166 were non-Pre-Kindergarten participants. The statistically significant results suggest Pre-Kindergarten participation did have an effect on the attendance rates of students. Specifically, these results suggest when children attended the district's Pre-Kindergarten program they missed fewer days of school in grade three than children who did not attend the Title I, Part A Pre-Kindergarten program.

Discussion

According to the Center for Public Education (2012), many educators have discovered reform efforts in Kindergarten through grade 12 were often too little, too late. By the time many children entered Kindergarten, they were already far behind their peers in skills and other measures of school readiness (Bohrnstedt, 2013). This has been the case of the school district where this research was conducted. As a result, Pre-Kindergarten programs were implemented with the goal of intervening early rather than waiting until the gaps had widened.

Considerable discourse has surrounded the long-term effects of Pre-Kindergarten. Specifically, do the effects dissipate over time or produce lasting benefits for the participants? One side of the Pre-Kindergarten conversation has focused on research results that have shown quality Pre-Kindergarten to have long-term positive effects on the future lives of young children (Campbell et al., 2008; Nores, Belfield, & Barnett, 2005; Reynolds et al., 2011; Schweinhart et al., 2005).

The results of this study have mixed findings. Analysis of MKAS^2 assessment data yielded significant differences between Pre-Kindergarten participants' and non-participants' scale scores, thus supporting the conversation that Pre-Kindergarten participation had achievement benefits that followed children after they left Kindergarten.

The MKAS^2 was used for two years as the 3rd Grade Reading Summative Assessment. The MKAS assessment was also given at the beginning and end of Pre-Kindergarten and Kindergarten. Additionally, MKAS^2 is a Renaissance Learning product, as is the STAR Early Literacy assessment. STAR Early Literacy was used in the elementary school prior to the required MKAS and MKAS^2 assessments. Use of both

online assessments prior to implementation of the 3rd Grade Reading Summative Assessment allowed teachers to develop familiarity with the assessments.

Researchers who followed children from preschool and Pre-Kindergarten programs through first to grade 12 found as children progressed through schooling, the differences in reading and mathematics test achievement scores between those who received preschool and Pre-Kindergarten programs and those who did not became smaller and smaller until there was a "fadeout" of all differences in gains (Leak et al., 2010). Duncan and Magnuson (2013) reported when children were in second grade, the benefits of participating in preschool and Pre-Kindergarten were non-existent. Farran and Lipsey (2016) reported by the end of 3rd-grade, children who did not attend Pre-Kindergarten scored higher on some achievement measurers than did the children who attended Pre-Kindergarten. Also, the children who did not participate in the Pre-Kindergarten program caught up, and in some areas scored higher, than did the Pre-Kindergarten participants (Ladd, Muschkin, & Dodge, 2014).

The Mississippi Academic Assessment Program English Language Arts Assessment was designated as the 3rd Grade Reading Summative Assessment in the 2016-2017 school year. Data analysis of this assessment showed while the scale scores of Pre-Kindergarten participants were higher than the scale scores of non-Pre-Kindergarten participants, the results were not statistically significant. As the Pre-Kindergarten participants' and non-participants' scores converged, the results followed the patterns reported by other researchers (Duncan & Magnuson, 2013; Ladd et al., 2014; Leak et al., 2010;).

The 2016-2017 school year was the first time the English Language Arts Assessment has been used as the 3rd Grade Reading Summative Assessment. As a result, there was much less familiarity with the assessment than there was with the MKAS^2.

Although the academic achievement gains of children who attend preschool and Pre-Kindergarten converge as children move through the early years of schooling, Yoshikawa et al. (2013) points out there are other significant benefits to the preschool and Pre-Kindergarten children, and to society as a whole. According to researchers, (Campbell et al., 2008; Nores et al., 2005; Reynolds et al., 2011; Schweinhart et al., 2005), in adulthood, participation has long-term positive effects in comparison to non-Pre-Kindergarten participants. The researchers reported other significant benefits such as higher wages, less crime, higher levels of educational attainment. School attendance is a contributing factor to higher levels of educational attainment.

This study found significant differences between Pre-Kindergarten participants' and non-participants' school attendance rates when measured at the end of 3rd-grade. A parents' commitment to their child's education has an impact on a young child's school attendance. This often manifests through parents enrolling their child in voluntary Pre-Kindergarten programs and ensuring school attendance. A parent's dedication to school attendance transcends grade levels. As a result, a child who comes from a home where school attendance is important will attend more school days and will have more exposure to academic content than a child who comes from a home where education is not important and misses school.

Gottfried (2010) found that school attendance was a contributing factor to higher academic achievement for both elementary and middle school students. Children who

were chronically absent in Kindergarten and first grade were 17% likely to read proficiently at the end of 3rd-grade, while only 64% of students who missed nine or fewer days in Kindergarten and first grade were likely to read on grade level at the end of 3rd-grade (Applied Survey Research, 2011).

Conclusions

As cited in the literature review, The Center for Public Education (2012) reported that many educators have discovered reform efforts in Kindergarten through twelfth grade are often too little too late. By the time many children reach Kindergarten, they are already far behind their peers in skills and other measures of school readiness. The cost of fixing Kindergarten through twelfth grade education comes at tremendous expense and with limited success as children progress through elementary, middle and high school (Center for Public Education, 2012; The Pew Center on the States, 2011). This realization has led many states to try to intervene early, rather than waiting until the educational gaps develop. As a result, many states are expanding their financial investments into Pre-Kindergarten programs and services better to help prepare children for school success (Center for Public Education, 2012). Pre-Kindergarten has emerged as a promising strategy to promote school readiness and close achievement gaps in elementary school and beyond.

The literature review described the landmark Pre-Kindergarten programs: High Scope Perry, Head Start, the Chicago Child Parent Center, and the North Carolina Abecedarian Program. A review of the literature surrounding the programs revealed each program was small, well-funded, and provided quality services to the children and

families they served. All programs had significant impacts on the children and families enrolled in the programs.

Included in the literature review were the characteristics of quality Pre-Kindergarten programs, academic gains of programs, and the initial cost of funding the programs as well as a long-range estimate of participant gains from the program. It also revealed that while all children can realize benefits from a Pre-Kindergarten program, children from low income homes benefit the most.

Federal legislation and its impact on Pre-Kindergarten programs was discussed, as well as the impact of the federal requirement of publicly reporting accountability data. While the federal legislation has not required reporting of Pre-Kindergarten and Kindergarten data, this has been pushed down to the respective grades. Additionally, school and school districts receiving Title I, Part A funds are allowed to use those dollars to implement Pre-Kindergarten programs. The Elementary and Secondary Education Act, as amended by NCLB, and subsequently amended by ESSA, has a foundational tenant of early childhood education to helping to ensure all children begin school on track and ready to learn.

Finally, the literature review followed Mississippi's journey to public Pre-Kindergarten. In 2012, Mississippi was one of ten states without state funded Pre-Kindergarten programs (Canter, 2012). Mississippi passed its first Pre-Kindergarten law, the Early Learning Collaborative Act, in spring of 2013. Prior to passage of the law, school districts across Mississippi could use Title I, Part A funds to implement Pre-Kindergarten programs. The MDE did not collect statistical data on the programs and

did not require school districts to have research-based evidence to measure the effectiveness of the programs (Canter, 2012).

Beginning with implementation of The Early Learning Collaborative Act in the fall of 2014, MDE mandated the Kindergarten Readiness Assessment be given twice a year to all Pre-Kindergarten and Kindergarten children enrolled in public school programs and to the Pre-Kindergarten children enrolled in an Early Learning Collaborative.

Chapter three detailed the design and methodology of the study used to test the research questions. The study was conducted in a rural, high poverty, high minority, public school district in Mississippi. The Pre-Kindergarten was funded with Title I Part A funds. Although the Pre-Kindergarten program had been in existence for six years, this study was the first empirical research to determine program effectiveness.

Participants were assigned to one of two groups: those who had attended the district's four-year-old Pre-Kindergarten program for a minimum of one half a school year and subsequently took the 3rd Grade Reading Summative Assessment and those who did not meet the Pre-Kindergarten attendance criteria.

Chapter four provided the results of the statistical analysis of the research questions and a discussion of the results. The statistical analysis used in the study was an Independent Samples *t*-Test and the Mann-Whitney U Test. Prior to performing a test on the data sets to address each research question, the assumptions of normality, homogeneity of variance, and independence of observations were tested. If the data met the afore listed assumptions, an Independent Samples *t*-Test was the test employed as the statistical analysis to determine if there were differences between the two groups. When

the data was found not to have met the assumption of normality, data were reviewed to determine if the assumptions of a non-parametric test were met. The data that did not meet the assumption of normality did meet the assumptions the Mann-Whitney non-parametric test.

The MKAS^2 data for school years 2014-2015 and 2015-2016 were combined into one data set. The data used to address Research Question 1 and Research Question 3 were analyzed by the Mann-Whitney U Test to determine if there was a statistically significant difference between Pre-Kindergarten participants' and non-participants' scale sores. Research Question 2 employed an Independent Samples *t*-Test to determine if there were statistically significant differences between female Pre-Kindergarten participants' and non-participants' MKAS^2 scale scores.

The Mississippi Academic Assessment Program English Language Arts scale scores were used to compare Pre-Kindergarten participants' and non-Pre-Kindergarten participants' achievement on the 3rd Grade Reading Summative Assessment for the 2016-2017 school year. Data for Research Question 1, Research Question 2, and Research Question 3 were analyzed by an Independent Samples *t*-Test to determine if there were statistically significant differences between Pre-Kindergarten participants' and non-participants' achievement on the 3rd Grade Summative Reading Assessment.

All attendance data from the 2014-2015, 2015-2016, and 2016-2017 were combined to address Research Question 4. An Independent Samples *t*-Test was employed as the statistical measure to determine if children who attended Pre-Kindergarten had higher rates of school attendance than children who did not attend Pre-Kindergarten.

The MKAS^2 was the 3rd Grade Reading Assessment given in the 2014-2015 and 2015-2016 school years. Analysis of MKAS^2 data for Research Questions 1 and Research 2 reported a statistically significant difference between Pre-Kindergarten participants' and non-participants' achievement on the 3rd Grade Reading Summative Assessment for the all students group and the female student group. The findings suggest there was a relationship between Pre-Kindergarten participation and reading achievement. Analysis of MKAS^2 data for Research Questions 3 did not yield a statistically significant difference between male Pre-Kindergarten participants' and non-participants' achievement on the 3rd Grade Reading Summative Assessment. The findings suggest there was not a relationship between Pre-Kindergarten participation and reading achievement.

The Mississippi Academic Assessment Program English Language Arts Assessment became the 3rd Grade Reading Summative Assessment in the 2016-2017 school year. Data analysis for Research Question 1 and Research Question 2 revealed there was not a statistically significant difference between Pre-Kindergarten participants' and non-participants' achievement on the 3rd Grade Reading Summative Assessment. While there were subtle differences on the subtest for males, the summative assessment not show Pre-Kindergarten to have a valid, long-term impact in the children's reading levels once they were assessed in 3rd-grade.

Analysis of data for Research Question 4 noted a statistically significant difference between Pre-Kindergarten participants' and non-participants' school attendance rates. The statistically significant difference demonstrated a relationship between attendance and Pre-Kindergarten participation.

Implications

Educators and policy makers must make data driven decisions to determine what areas of education are wise investments and which areas are not obtaining the desired academic outcomes. The results of this study can have implications for educators and policymakers as they make decisions related to Pre-Kindergarten. Perhaps its benefit is better realized as a stimulant to improve attendance and social outcomes than to be realized through statistical inferences and antidotal data.

Study Limitations

There were limitations to this study that may have potentially impacted or influenced the findings. This study was conducted in a rural, high poverty, high minority, public school district in Mississippi. As a result, the findings from this study may be generalized when comparing the progress of other demographically similar public-school districts. The timeframe of the study is limited to the student population who completed 3rd-grade at the end of the 2014-2015, 2015-2016, and 2016-2017 school years.

A limitation of the study was the 3rd Grade Reading Summative Assessment. The assessment was implemented by MDE in the 2014-2015 school year. The MKAS^2 was the required assessment for the 2014-2015 and 2015-2016 school years. The Mississippi Academic Assessment Program English Language Arts Assessment was the required assessment in the 2016-2017 school year.

The small sample size for the study was another potential limitation. The number of total number of students who took the MKAS^2 was 72 Pre-Kindergarten participants and 110 non-participants. There were 33 Pre-Kindergarten participants and 56

non-participants who took the Mississippi Academic Assessment Program English Language Arts Assessment.

The Pre-Kindergarten and non-Pre-Kindergarten groups were intact prior to this study. All students who participated in Pre-Kindergarten for a minimum of one-half a school year were included in the study, as were all students who took the 3rd Grade Reading Summative Assessment. Lack of sampling was a limitation. As a result, the findings of the study cannot be generalized to populations that employed a probability sampling method.

Pre-Kindergarten teacher qualifications were a limitation of the study. An MDE early childhood licensed teacher staffed each of the Title I, Part A Pre-Kindergarten programs. Thus, the results are not generalizable to other Pre-Kindergarten programs where the class was taught by a non-licensed teacher.

Another study limitation was the non-normal distribution of the $MKAS^2$ for the all student group and the male student group. $MKAS^2$ data transformation failed to achieve normality. The male student group scale scores on the Mississippi Academic Assessment Program English Language Arts Assessment were not normally distributed. Normality was achieved through data transformation.

A potential limitation of the study was the 92% poverty rate of the school district. Research in the literature review noted the potentially negative impact of poverty on student cognition and achievement.

The study was limited to the effort students put forth on the 3rd Grade Reading Sumative Assessment. Although participants were encouraged to do well on the assessment, the researcher could not control for the participants' intent.

Technology was also a limitation. If the technology, including both hardware and the online assessment, did not work as designed, children may have been frustrated or confused, which could have negatively impacted their scores. Additionally, participants who came from homes where computers and hand-held devices were readily available had more familiarity with how to navigate through a software-based assessment than did participants whose homes lacked computers and hand-held devices (White, Kim, Chen, & Liu, n.d.). Reliable data on the degree to which the child's parents and caregivers assisted participants with schooling activities, such as reading at home, were not available.

One potential source of bias in the study was researcher bias. Although some bias is inevitable, the researcher attempted to control for bias in data collection and presentation of results.

Recommendations

While this study furthers the school district leaders, policymakers, and other districts with greater understanding of a Title I, Part A Pre-Kindergarten program within a high minority, high poverty, public school district, further research is needed. The researcher makes the following recommendations for future research:

1. Conduct a longitudinal study to determine how students who received Pre-Kindergarten services compared to those who did not in later grades such as grades five, eight, and a later high school grade.
2. Replicate the study with data from the children who received Pre-Kindergarten services in an Early Learning Collaborative in Mississippi.
3. Replicate the study with multiple Title I, Part A Pre-Kindergarten programs across Mississippi in high minority, high poverty, public school districts.

4. Determine if participants who did not attend the Title I, Part A Pre-Kindergarten program received Pre-Kindergarten services elsewhere and control for those variables.
5. Conduct a qualitative study of 3rd grade teachers to see if they recognize a difference between the Pre-Kindergarten participants and non-participants.

Summary

This expands the dialog and intellectual discourse regarding Pre-Kindergarten education, specifically Pre-Kindergarten in a rural, high poverty, high minority school district. While the MKAS^2 results yielded a statistically significant difference between Pre-Kindergarten participants and non-participants for the all student group and the female student group, the Mississippi Academic Assessment English Language Arts Assessment did not find a statistically significant difference between the two groups. The same pattern was found with the male student group. The MKAS^2 results were not statistically significantly different, but the results of the Mississippi Academic Assessment English Language Arts Assessment were statistically significantly different.

Further research using multiple years of data from the 3rd Grade Reading Summative Assessment may provide relevant evidence on the significance of Pre-Kindergarten participation in comparison to non-participation to assess its quantitative impact on academic progress in school settings across the nation.

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APPENDIX A

INSTUTIONAL REVIEW BOARD APPROVAL

Protocol ID: IRB-17-556

Review Type: EXEMPT

Principal Investigator: Angela Farmer

You are receiving this inactivation notification for one of the two following reasons:

Exempt Determinations:

This protocol is has been granted an exemption determination. Based on this exemption, and in accordance with Federal Regulations which can also be found in the MSU HRPP Operations Manual, your research does not require futher oversight by the HRPP.

Therefore, this study has been inactivated in our system. This means that recruitment, enrollment, data collection, and/or data analysis can continue, yet amendments to this study are no longer required. If at any point, however, the risk to participants increases, you must contact the HRPP immediately.

Non-Exempt Approvals (Expedited or Full Board):

A request to inactivate (with the submission of a final report) your non-Exempt protocol was submitted and approved. If this is the case, there should be no further data collection or data analysis conducted under this protocol.

For additional questions pertaining to this study, please contact the HRPP at irb@research.msstate.edu